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Factors associated with attrition from a randomized controlled trial of meaning-centered group psychotherapy for patients with advanced cancer

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Abstract

Objective—The generalizability of palliative care intervention research is often limited by high rates of study attrition. This study examined factors associated with attrition from a randomized controlled trial comparing meaning-centered group psychotherapy (MCGP), an intervention designed to help advanced cancer patients sustain or enhance their sense of meaning to the supportive group psychotherapy (SGP), a standardized support group.

Methods—Patients with advanced solid tumor cancers ($n = 153$) were randomized to eight sessions of either the MCGP or SGP. They completed assessments of psychosocial, spiritual, and physical well-being pretreatment, midtreatment, and 2 months post-treatment. Attrition was assessed in terms of the percent of participants who failed to complete these assessments, and demographic, psychiatric, medical, and study-related correlates of attrition were examined for the participants in each of these categories.

Results—The rates of attrition at these time points were 28.1%, 17.7%, and 11.1%, respectively; 43.1% of the participants (66 of 153) completed the entire study. The most common reason for dropout was patients feeling too ill. Attrition rates did not vary significantly between study arms. The participants who dropped out pretreatment reported less financial concerns than post-treatment dropouts, and the participants who dropped out of the study midtreatment had poorer physical health than treatment completers. There were no other significant associations between attrition and any demographic, medical, psychiatric, or study-related variables.

Conclusions—These findings highlight the challenge of maintaining advanced cancer patients in longitudinal research and suggest the need to consider alternative approaches (e.g., telemedicine) for patients who might benefit from group interventions but are too ill to travel.

Keywords

attrition; psychotherapy; meaning; cancer; palliative care

Introduction

A growing number of studies have examined the effects of palliative care interventions. Still, research in this area is limited [1] in part because work with palliative care populations is challenging to execute because of the patients' physical limitations and compromised health status [2–4]. In order to advance the field of palliative care research, it is important to identify and address barriers to patient retention in longitudinal studies, including variables that contribute to attrition. Attrition from intervention studies, which has been defined as the loss of a study participant during the intervention and follow-up period, reduces statistical power, and detracts from the internal and external validity of study results [5–7]. It is therefore important to identify and evaluate various predictors of attrition in order to both appropriately interpret study findings and maximize the potential benefits of clinical research.

A large body of literature has examined attrition in psychotherapy and clinical research in the general population [8–19]. In psycho-oncology, few studies focus directly on attrition from psychosocial interventions, for example [7], although attrition is often examined as a secondary outcome of interest [20–22]. These studies have identified several variables that predict attrition, which are explored in the following section.

Mental health

There is increasing evidence that poor mental health is a risk factor for attrition from various study modalities (e.g., medication and psychotherapy trials) and patient populations. In particular, the presence of mood and anxiety disorders, as well as subclinical anxious and depressive symptoms, predicted attrition in a number of prior studies [12,18,23–30]. For example, in a trial of mindfulness-based stress reduction designed to facilitate post-traumatic growth and spirituality in outpatients with cancer, those who were lost to follow-up demonstrated more mood disturbance, including depression and anxiety, than the patients who remained in the study [31]. Patients who are depressed may be less motivated to participate in the treatment than nondepressed or anxious patients [13,32].

Physical health

Numerous studies have shown that patients' physical health status is a predictor of attrition, [1,3,4,20,22,33–38]. Among the primary reasons for attrition, investigations cited comorbid medical and psychiatric conditions, health deterioration, and death. For example, using the data from a study of a cognitive-behavioral intervention for cancer patients receiving chemotherapy, Siddiqi *et al.* [7] examined predictors of attrition during the two early phases of the study: from consent to screening and from screening to intake. The authors found that greater physical symptom severity reported at the screening was associated with attrition between the screening and intake assessment.

Demographic factors

Several demographic variables have also been associated with attrition including age, race, and gender. For example, older age has generally been identified as a risk factor for attrition, largely because of associated physical health symptoms and elevated rates of mortality [39,40]. Minority race has also been found to be a predictor of attrition [19,41–49]. For example, in a trial of complementary and alternative medicine for women with advanced breast cancer, Sikorskii *et al.* [50] found higher early dropout rates among black women when compared with other (primarily white) women in the study. In the few studies that have examined the relationship between gender and attrition, results have generally indicated that men are more likely to drop out than women [20,29]. Finally, there is evidence of an inverse relationship between rates of attrition and socioeconomic status, with

higher rates of attrition being associated with lower income and less education [17,51,52]. Much of this research, however, has focused on physically healthy samples as opposed to terminally ill participants.

Group preference

In several randomized controlled trials, investigators have examined the impact of patient preference for the type of intervention to which they are randomized on treatment outcome [13,53–60]. The relationship between patients being randomly matched to their preferred intervention arm and attrition is not yet clear. In one study of the impact of participant preference on improvement in depression, Kwan and colleagues [61] found a mismatch between preferred and actual treatment received that was associated with greater likelihood of attrition and subsequently, decreased change in depression. However, two meta-analyses of such studies [58,62] found that although participants' preferences significantly impacted recruitment (i.e., participants refused randomization because of preferences), once enrolled in studies, a mismatch in preference and intervention assignment did not negatively impact attrition.

Study aims

The purpose of the present study was to gain a better understanding of variables that contributed to attrition among participants in a randomized controlled trial of meaning-centered psychotherapy for advanced cancer patients. Numerous palliative care studies have demonstrated substantial retention challenges in research involving advanced cancer patients [63]. Therefore, understanding both patient and study-related predictors of attrition will help us to better understand any selection biases that might be impacting the study sample and to address modifiable factors over the course of study participation. We hypothesized that certain demographic (i.e., older age, nonwhite race), psychiatric (i.e., depressive and anxious symptomatology and hopelessness), medical (i.e., cancer stage, functional impairment), and study-related (i.e., increased length of time between initial consent and the start of treatment, mismatch between preference for study arm and group assignment) factors would be significantly related to increased attrition. Other variables (i.e., religiosity, spirituality, current medical and psychiatric treatment, location of residence, referral source, study arm) were included for exploratory purposes, without *a priori* hypotheses about the direction of their relationship with attrition.

Method

Participants

Participants were recruited from outpatient clinics at Memorial Sloan-Kettering Cancer Center (MSKCC) in New York City between August 2007 and July 2010 primarily through posted flyers or physician referral. Eligible patients were diagnosed with stage III or IV solid tumor cancers or nonHodgkin's lymphoma, were ambulatory, over 18 years old, and English speaking. Patients were excluded if they had significant cognitive impairment or psychosis, or physical limitations that precluded participation in an outpatient group intervention. Prospective participants were informed of the risks and benefits of study participation and were provided written informed consent. The study was approved by the Institutional Review Board of MSKCC and Fordham University. The data presented are from an ongoing study of a randomized controlled trial of MCGP for patients with advanced cancer.

Demographic characteristics of the study sample are presented in Table 1. A total of 153 participants provided informed consent; 79 were randomized to MCGP and 74 to SGP. Participants were predominantly female ($n = 108$, 70.6%) and white ($n = 122$, 79.7%). Most

participants ($n = 129$, 79.6%) were diagnosed with stage IV disease. There were no significant differences in any demographic variables between treatment arms.

Procedures

Participants were randomized to groups of 8–10, which were assigned using block randomization to ensure roughly equal numbers of groups in each treatment arm. The baseline assessment occurred before the first intervention session (week 1), the postintervention assessment occurred after the final intervention session (week 8), and the follow-up assessment occurred 2 months later (week 16). The assessment battery included the Hospital Anxiety and Depression Scale [64], the Beck Hopelessness Scale (BHS [65]), the Beck Depression Inventory (BDI; [66]), the Functional Assessment of Chronic Illness Therapy (FACIT)-Spiritual Well-Being Scale (SWB; [67,68]), and the Intrinsic/Extrinsic Religiosity Scale (IE-12; [69]). Each of these measures has been widely used in terminally ill populations. Additional data gathered at baseline included demographic (e.g., age, race, education, distance from home to treatment center) and clinical data (e.g., cancer diagnosis, stage of disease, Karnofsky Performance Rating Scale (KPRS) [70,71]). Demographic and clinical data were collected via self-report, but participants' cancer diagnosis and stage was verified via review of medical records. Additionally, the KPRS was administered by the study staff. Participants also completed a Pre-Randomization Preference Questionnaire, a face valid questionnaire developed by the investigators to assess participants' preference for group content and assignment. Participants were asked to rate their preferences on a Likert-type scale (0 = not at all, 4 = very much) for three aspects of group psychotherapy content (social support, expression of feelings, and finding a sense of meaning and purpose in life) and were also asked whether they had a preference for MCGP versus SGP (they were told this information was solely for analytic purposes and would not influence group assignment). This assessment battery was designed to be completed in a short period of time and be minimally burdensome to minimize the risk of attrition because of the assessment procedures.

Meaning-centered group psychotherapy

Meaning-centered group psychotherapy was developed by Breitbart and colleagues [72–74] to help patients with advanced cancer sustain or enhance a sense of meaning, peace, and purpose in their lives even as they approach the end of life. MCGP is a manualized, 8-week intervention influenced by the work of Viktor Frankl [75,76] and utilizes didactic discussion and experiential exercises focused on meaning and advanced cancer. Each 90-minute session addresses specific themes related to concepts and sources of meaning, the relationship and impact of cancer on one's sense of meaning and identity, and placing one's life in a historical and personal context (i.e., understanding one's legacy). Although the focus of each session is on issues of meaning and purpose in life in the face of advanced cancer and a limited prognosis, elements of support and expression of emotion are inevitable. MCGP groups were conducted by a psychiatrist, clinical psychologist, or social worker, all with experience treating patients with cancer; groups were co-led by a second doctoral level psychologist or psychology doctoral student. Group facilitators underwent an extensive training in MCGP (approximately 24–28 hours of didactic and observational training) prior to the study and received supervision from the developer of the intervention.

Supportive group psychotherapy

The supportive group psychotherapy intervention was based on a model developed by Cain *et al.* [77] and manualized by Payne *et al.* [78]. The eight, weekly 90-minute sessions focused on discussion of issues that commonly emerge for patients coping with advanced cancer. Utilizing a supportive approach, therapists focused on encouraging the patients to share concerns they have in coping with cancer and its treatment and to offer support and

advice to other group members. Group facilitators underwent an extensive training in SGP prior to the study. Groups were led by a clinical psychologist or licensed social worker, with a social worker or psychology doctoral student co-therapist. MCGP and SGP facilitators had comparable levels of experience and training in group psychotherapy and treatment of patients with cancer.

Statistical analyses

Dropouts were categorized into the following attrition groups: (i) the proportion of participants who completed the screening assessment and informed consent procedures but dropped out before the baseline assessment (pretreatment dropouts); (ii) the proportion of participants who completed the baseline assessment but dropped out before the post-intervention assessment (midtreatment dropouts); (iii) the proportion of participants who completed the post-intervention assessment but who did not complete the follow-up assessment (post-treatment dropouts); and (iv) the proportion of participants who completed the entire trial (treatment completers).

Chi-square analyses and ANOVAs were used to identify significant correlates of attrition using a categorical variable differentiating pretreatment dropouts, midtreatment dropouts, post-treatment dropouts, and treatment completers. Statistically significant effects were further analyzed using *post hoc* tests to more precisely identify the nature of the associations observed in the ANOVAs. For a subset of analyses, we identified specific contrasts *a priori* in order to examine the effects of particular variables on attrition (e.g., the association between length of delay in randomization after initial study recruitment and pretreatment attrition).

Results

The pattern of attrition from this randomized controlled trial of the MCGP psychotherapy is presented in Figure 1. One hundred and fifty-three participants met the inclusion criteria and provided informed consent. Of these, 43 (28.1%) dropped out pretreatment, 27 (17.7% of the original sample; 24.5% of the participants who began treatment) dropped out midtreatment, and 17 (11.1% of the original sample and 20.5% of those who completed treatment) dropped out post-treatment, leaving a final sample of 66 participants (43.1% of the original sample) who completed the trial. There were no significant differences in rates of attrition at these four time points between the participants assigned to the two intervention arms, $\chi^2(3, n = 153) = 2.80, p = 0.42$.

When possible, the explanations the participants gave for withdrawing from the study were recorded. Not surprisingly, the most common reason for dropping out of the study at any time point was being 'too sick' ($n = 35, 23\%$), followed by logistical barriers ($n = 25, 16\%$), which included scheduling conflicts or difficulty securing transportation. Other reasons for dropout included death ($n = 9, 5.9\%$) and losing interest in therapy ($n = 9, 5.9\%$). Nine (5.9%) participants were lost to follow-up (i.e., no information regarding the reasons for termination was provided).

Demographic and medical factors

Among the demographic and medical variables studied, few were significant correlates of attrition (see Table 1). In fact, the only variable that differed significantly across groups was the extent of financial concerns reported by participants (evaluated with a four-level Likert-type scale), $F(3, 148) = 2.80, p = 0.042, \eta^2 = 0.055$. *Post hoc* comparisons of groups indicated that pretreatment dropouts reported less concern about finances than post-treatment dropouts ($p = 0.016$).

There was a trend suggesting significant differences in KPRS scores across the four attrition groups, $F(3, 149) = 2.59, p = 0.055, \eta^2 = 0.051$. *Post hoc* tests indicated that treatment completers had significantly higher KPRS scores than midtreatment dropouts ($M = 85.4, SD = 9.1$ versus $M = 79.6, SD = 11.6$), $p = 0.012$. However, there were no significant associations between attrition and stage of disease or time since initial cancer diagnosis. Additionally, there were no significant differences between attrition groups in symptoms of depression, anxiety or hopelessness (as assessed by the BDI, Hospital Anxiety and Depression Scale, and BHS, respectively) or degree of religiosity or spirituality (as assessed by the FACIT-SWB and the IE-12, respectively). These data are presented in Table 2.

Study-related attrition factors

We also investigated study-related variables that may have influenced attrition at specific time points. For example, because participants were often recruited for study participation several weeks before the group began, we examined whether the length of time between the initial consent and the start of treatment impacted participation. This analysis compared the length of treatment delay in participants who dropped out before treatment began (pretreatment dropouts, $n = 43; M = 31.41, SD = 28.41$) to those who began treatment ($n = 110; M = 28.38, SD = 22.25$). Contrary to expectations, duration of time between recruitment and treatment initiation was not significantly related to pretreatment attrition, $r(150) = -0.69, p = 0.49$.

We also evaluated whether the match between participants' pretreatment preferences for group assignment and their actual group assignment impacted attrition. We hypothesized that participants who were matched to their preferred treatment would be less likely to drop out of the study during the course of treatment than those who were mismatched or had no preference. Of the 139 participants who completed the prerandomization questionnaire, 60 were matched to their preferred treatment, 68 were mismatched, and 11 had no preference. There was no significant variation in the proportion of participants who were matched to their preferred treatment at any attrition time point, $\chi^2(3, n = 128) = 2.04, p = 0.56$.

Additional study-related factors included in our analyses are presented in Table 1. Because MSKCC draws participants from a wide geographic region, we analyzed whether participants' location of residence (i.e., distance from the treatment center) was significantly related to attrition pretreatment and midtreatment. No significant associations emerged between location of residence and attrition at either of these time points, $p > 0.10$. Participants' referral source was also examined. Eighty-one (52.9%) participants were referred by treating clinicians within the Department of Psychiatry and Behavioral Sciences (e.g., participants had been in treatment with a staff member or had been involved in a previous study), 63 (41.2%) participants were referred by physicians in the other MSKCC services (e.g., breast, gastrointestinal), and 9 (5.9%) participants were self-referred. Referral source was not related to attrition, $p > 0.10$. Finally, we examined whether current engagement in medical or psychiatric treatment was associated with attrition. Neither engagement in medical interventions (e.g., chemotherapy, hormonal therapy; $p > 0.10$) or psychotherapeutic interventions (e.g., individual psychotherapy, psychotropic medication; $p > 0.10$) was significantly associated with attrition.

Discussion

Research involving patients with advanced cancer is often plagued by high levels of attrition. In this study, we observed an attrition rate exceeding 50%, despite recruiting an ambulatory sample with a relatively low rate of mortality during the course of the study (5.9%). The overall rate of attrition (56.9%) was high relative to psychotherapy trials in general, but comparable with previous psychosocial interventions involving advanced

cancer patients [22,79]. Although lower attrition rates (e.g., 10%) have been reported in prior psychotherapy intervention trials for cancer patients [80,81], these studies targeted cancer survivors or patients at earlier disease stages and had shorter active and follow-up phases (e.g., a 3–4 week intervention period versus 2 months in this study). Rates of attrition from group psychotherapy intervention trials for physically healthy patients have ranged from 18% to 66% [11,82,83], indicating that attrition is a concern even in research with non-medical populations.

In both study treatment arms, the rates of attrition were greatest during the time period before treatment began. These findings likely reflect the challenges associated with recruiting participants for a group-based intervention, as recruitment occurs sequentially and participants recruited early in the process are typically forced to wait much longer than those recruited later. In our study, the average length of time between recruitment and treatment initiation was 28 days, but the range was 1–158 days. In their study of factors that predicted attrition among older cancer patients and their caregivers, Neumark and colleagues [48] also found higher rates of attrition before the data collection phase began. However, although we expected that a longer delay before starting the intervention would correspond to a greater likelihood of attrition based on prior studies [7], no such association was found. This suggests that attrition was generally due to factors not associated with time, such as treatment schedule changes at an active tertiary cancer center. It is also possible that there may not be a linear relationship between delay in treatment initiation and attrition. For example, it may be that any delay greater than a few weeks may lead to attrition, but that participants who waited for 6 weeks may not be more likely to drop out than the participants who waited for 4 weeks.

Attrition was not associated with any of the demographic variables studied. This was surprising, as several previous investigations have found relationships between attrition and demographic variables such as race, age, and gender [7,20,47]. We did find that attrition was related to less concern about finances, a variable not widely studied by past researchers. Participants who dropped out of the study after the baseline assessment reported fewer concerns than those who remained in the study through the intervention phase. Although one might anticipate that financial difficulties corresponding to increased rates of attrition, this seemingly counterintuitive finding may reflect the influence of the financial compensation offered to study participants (\$15/session) or the appeal of free treatment. It is possible that the financial incentive for study participation and/or provision of free psychotherapy increased the incentive to complete the treatment. Although high quality mental health treatment was available at the recruiting institution, patients may be unaware of these services or reluctant to risk accepting services that may require copayment in addition to their insurance coverage. Of course, this assessment would be more complete if financial information such as income level and type of insurance coverage had been available for study participants.

Not surprisingly, attrition from psychosocial intervention studies in palliative care settings has consistently been linked to poor physical health [22,84], a finding that was supported by the present study. Although differences across groups were modest, treatment completion was associated with lower functional impairment (assessed by the KPRS). Given that the majority of participants enrolled had stage IV solid tumor cancers or nonHodgkin's lymphoma, we expected that many participants would experience a decline in their health over the course of the study. It was therefore not surprising that the primary reason for attrition was being 'too sick.'

We found that physical well-being was associated with attrition, whereas psychological well-being was not. Attrition was not significantly associated with depression, anxiety or

hopelessness. Although prior investigations have identified psychopathology as a risk factor for attrition [12,31], these studies have not focused on medically ill populations. The null findings in the current investigation suggests that, for medically ill patients, physical health is a more influential factor than mental health in determining who will terminate the treatment prematurely. It is also possible that the patients who are medically ill and already involved in the healthcare system may be less reluctant to accept mental health treatment than patients in the general population, perhaps because they perceive less stigma associated with this care, and this greater mental healthcare utilization may have translated into the nonsignificant findings regarding mental health and attrition. Indeed, nearly half ($n = 76$, 49.7%) of the participants in this study were receiving psychiatric care (i.e., psychotherapy or psychotropic medications) at the time of the baseline assessment.

Finally, the match between the participants' preferred treatment and group assignment was unrelated to attrition. Although we expected that participant preference and match would influence participation [58], the findings in the literature are inconsistent. In fact, one meta-analysis concluded that a mismatch between treatment preference and assignment in medical and psychiatric interventions was associated with treatment completion [61]. Nevertheless, our finding that the match between intervention preference and assignment did not predict attrition is promising and suggests that any positive outcomes ultimately observed are more likely to be due to the efficacy of the intervention(s) than to self-selection.

Limitations

Like many treatment outcome studies, one of the primary limitations of this study was the absence of information that may have helped us more accurately interpret the patterns of attrition observed. Some of the variables analyzed – such as distance from treatment center, financial concerns, and even treatment preference – provided an imperfect proxy for the underlying constructs of interest. Although distance between one's home and the treatment center provided us with some information about potential challenges participants may have faced in traveling to our treatment center, the extent to which this variable might impact attrition is moderated by a range of other variables such as wealth (e.g., access to a car, ability to pay for parking/tolls), employment status, and familiarity with New York City. For example, patients who live far away but have traveled to New York City regularly may be more likely to attend treatment than someone who lives within the city limits but requires extensive bus and subway travel to reach the study site. Our examination of whether participants were matched to their preferred treatment did not take into account the strength of patient pretreatment preferences and patients' understanding of what the different interventions actually involve. Patients may have expressed an interest in an intervention because of the brief description provided during the consenting process, yet be unhappy with the format (e.g., homework assignments, structured discussions). Although greater precision in measurement would address some of these limitations, a more thorough analysis of attrition also requires analyzing the inter-relationships among multiple related predictor variables (e.g., distance from the treatment center may be more relevant for patients who work full-time or have limited financial resources, indicating an interaction effect among these variables). Additionally, it should be noted that in general, participants in this study were highly educated and employed and primarily white, characteristics which limit the generalizability of the study findings.

Another common limitation in studies of attrition is the lack of detailed information about reasons for dropout from those who are lost to follow-up. Although we were able to obtain data on reasons for attrition for approximately 90% ($n = 78$) of the participants who dropped out, the accuracy of explanations provided by these participants is unknown. Participants may have offered more socially desirable explanations, such as illness, rather than expressing their dissatisfaction with the intervention or therapists. There is, of course, no

obvious solution to this dilemma, but with a larger sample, we might have been able to conduct separate analyses for attrition subgroups, such as identifying different predictors of dropout because of illness versus those who dropped out because of logistical problems or those related to group dynamics. The inclusion of a measure of therapeutic alliance (e.g., The Working Alliance Inventory [85]), for example, would have provided us with more detailed information regarding participants' feelings regarding emotional investment in the therapy and relationship with group leaders. Unfortunately, the sample sizes necessary for such a detailed analysis of attrition is far greater than is likely available in most treatment outcome studies.

Finally, studies of attrition may also be impacted by the treatment setting in which the research occurs. In the present study, the participants were recruited from the outpatient clinics of MSKCC, a tertiary care facility providing high quality care and engaged in numerous clinical trials. This patient population may be quite different than what might be found in a community-based setting, where patients are not as frequently inundated with research opportunities and may perceive an offer of research participation as an opportunity to gain access to high quality treatment that would otherwise be unavailable. On the other hand, attrition may be heightened in the tertiary care treatment setting, as patients who engage in, or are offered participation in, multiple research studies may feel less obligated to complete any individual study. Future research might contrast rates of attrition across different patient subgroups in order to identify distinct patterns of attrition in these various settings.

Future directions

Clinical research with palliative care populations should attempt to identify methods for retaining severely ill patients, such as examining the impact of telemedicine or home visits. They should also make rigorous efforts to obtain information about reasons for dropout, and when possible, make accommodations to retain participants. Without such efforts, the external validity of findings of these trials will suffer. In light of the few positive findings in this study, future research is needed to explore the relative importance of the patients' physical functioning in the context of variables that have previously been identified as significant predictors of attrition (e.g., mental health, demographic factors). Additionally, studies that include assessments of the therapeutic relationship would allow us to better understand the extent to which the therapeutic relationship contributes to retention in psychotherapy trials. Finally, the palliative care psychotherapy treatment outcome literature would be enhanced by inclusion of strategies for increasing participant retention (and their successfulness) so that future studies may benefit from effective methods.

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Figure 1.
Study flowchart and defined attrition groups

Table 1

Sociodemographic characteristics of participants according to attrition category

	<u>Pretreatment</u>		<u>Dropouts</u>		<u>Midtreatment</u>		<u>Dropouts</u>		<u>Post-treatment</u>		<u>Dropouts</u>		<u>Completers</u>		<i>p</i>	<i>χ²/F</i>	<i>z/φ</i>
	N/M	%/SD	N/M	%/SD	N/M	%/SD	N/M	%/SD	N/M	%/SD	N/M	%/SD	N/M	%/SD			
Age	57.53	11.92	60.96	12.86	57.12	11.43	59.94	9.55	0.93	0.59	0.26						
Years of education	15.61	2.76	16.59	2.68	16.60	2.13	16.0	2.37	0.97	0.48	0.08						
Sex																	
Male	16	37.2	7	25.9	5	29.4	17	25.8									
Female	27	62.8	20	74.1	12	70.6	49	74.2									
Race	7.39	0.29	0.29														
White	30	69.8	21	77.8	14	82.4	57	86.4									
African-American	8	18.6	3	11.1	3	17.6	7	10.6									
Asian	5	11.6	3	11.1	0	0.0	2	3.0									
Marital status																	
Single	9	20.9	9	33.3	4	23.5	13	19.7									
Married/cohab.	21	48.9	15	55.6	10	58.8	33	50.0									
Divorced/sep/wid	13	30.2	3	11.1	3	17.7	20	30.3									
Employment status																	
Unemployed	7	16.3	5	18.5	3	17.7	13	19.7									
Employed	12	27.9	8	29.6	7	41.2	17	25.8									
Disabled	12	27.9	6	22.2	4	23.5	17	25.8									
Retired	12	27.9	8	29.6	3	17.7	19	28.8									
Religion																	
Catholic	11	25.6	10	37.0	6	35.3	20	30.3									
Protestant	4	9.3	3	11.1	2	11.8	11	16.7									
Jewish	13	30.2	5	18.5	3	17.6	20	30.3									
None	6	14.0	4	14.8	4	23.5	4	6.1									
Other	9	20.9	5	18.5	2	11.8	11	16.7									
Cancer diagnosis																	
Breast	13	30.2	6	22.2	3	17.6	21	31.8									
Chl/rec/pro/tes*	7	16.3	2	7.4	1	5.9	11	16.7									

	Pretreatment		Dropouts		Midtreatment		Dropouts		Post-treatment		Dropouts		Completers		χ^2/F	p	$2/\phi$
	N/M	%/SD	N/M	%/SD	N/M	%/SD	N/M	%/SD	N/M	%/SD	N/M	%/SD	N/M	%/SD			
Pan/liv/stom/kid**	9	20.9	10	37.0	6	35.3	7	10.6									
Lung/bronchi	5	11.6	6	22.2	4	23.5	12	18.2									
Other	9	20.9	3	11.1	3	17.6	15	22.7									
Region															4.53	0.87	0.87
Manhattan	13	30.2	10	37.0	4	23.5	22	33.3									
Outer boroughs	11	25.6	6	22.2	6	35.3	18	27.3									
Adjacent counties	4	9.3	5	18.5	3	17.6	9	13.6									
Farther away	15	34.9	6	22.2	4	23.5	17	25.8									
Referral source																	
PBS***	28	65.1	13	48.1	8	47.1	8	47.1	6.36	0.38	0.13						
MED****	14	32.6	11	40.7	7	41.2	7	41.2									
Self	1	2.3	3	11.1	3	11.1	2	11.8									
Current medical treatment																	
Chemotherapy	31	72.1	24	88.9	12	70.6	45	68.2	4.79	0.19	0.12						
Hormonal therapy	7	16.3	2	7.4	1	5.9	5	7.6									
Surgery	2	4.7	1	3.7	0	0.0	4	6.1									
Radiotherapy	2	4.7	1	3.7	1	5.9	1	1.5									
Current psych treatment																	
Yes	19	44.2	14	51.9	8	47.1	35	53.0	0.42	0.94	0.05						

* Colon/rectal/prostate/testes.

** Pancreas/liver/stomach/kidney.

*** Department of Psychiatry and Behavioral Sciences, MSKCC.

**** Other medical departments inside of MSKCC.

Table 2

Clinical characteristics of participants according to attrition category

	<u>Pretreatment</u>		<u>Dropouts</u>		<u>Midtreatment</u>		<u>Dropouts</u>		<u>Post-treatment</u>		<u>Dropouts</u>		<u>Completers</u>		<i>F</i>	<i>p</i>	²
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
KPRS	83.0	10.1	79.6	10.2	80.7	11.6	85.4	9.0	2.59	0.06	0.05						
Financial concern *	2.7	1.2	2.6	1.1	3.5	1.1	3.0	1.2	2.80	0.04	0.06						
Depression (BDI)			15.7	6.0	16.7	9.9	15.4	9.1	1.13	0.33	0.38						
Anxiety (HADS-A)			7.7	5.2	6.8	4.2	6.7	4.2	0.43	0.65	0.01						
Hopelessness (BHS)			6.1	5.0	6.5	6.8	6.3	5.2	0.56	0.92	0.12						
Spiritual well-being (FACIT)			30.3	13.5	31.6	10.3	30.0	11.7	1.20	0.26	0.41						
Religiosity (IE-12)			6.3	4.3	10.2	5.3	7.5	4.6	0.50	0.94	0.09						

KPRS, Karnofsky Performance Rating Scale; BDI, Beck Depression Inventory; HADS-A, Hospital Anxiety and Depression Scale-A; BHS, Beck Hopelessness Scale; FACIT, Functional Assessment of Chronic Illness Therapy; IE-12, Intrinsic/Extrinsic Religiosity Scale-12.

* Financial concern was evaluated on a Likert scale from 1 (Not concerned at all) to 5 (I am so concerned that it's hard to think of anything else).