

End Stage Renal Disease and Nonadherence to Hemodialysis: Evaluation of a Psychodynamic Intervention

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Background: Skipping and shortening hemodialysis treatments are common and result in increased morbidity and mortality. **Objective:** The goal was to test whether a psychodynamic intervention reduced the number of skipped and the minutes of shortened hemodialysis sessions. **Methods:** A quasi-experiment conducted at one hemodialysis outpatient center was used to test a psychodynamic intervention. The intervention was delivered weekly for eight weeks to intervention group patients ($n=13$). Comparison group ($n=8$) patients received routine care. **Results:** Adherence improved for the intervention group from the Before Phase to the Treatment Phase and After Phase on all outcomes. The mean number of hemodialysis sessions skipped was 1.9 in the Before Phase and .9 in the Treatment Phase ($p=.01$) and .5 in the After Phase ($p=.01$). During the Treatment Phase the intervention group skipped less than one session while the comparison group skipped 3.5 hemodialysis sessions ($p<.001$). Adherence did not improve for comparison group patients. **Conclusions:** A psychodynamic intervention may be an acceptable and effective treatment for reducing nonadherence to hemodialysis.

More than 383,992 people in the U.S. are on hemodialysis, and 116,946 patients began ESRD therapy in 2010 (U S Renal Data System, 2012). Hemodialysis, a treatment for removing waste substances and fluid from the blood when the kidneys are unable to do this, is the most common treatment for ESRD. Most hemodialysis patients receive three treatments per week for three-to-four hours per treatment (American Kidney Fund, 2013; Ranganathan & John, 2012). Adherence to the treatment protocol refers to the extent to which a person follows the nephrologist's prescribed orders for taking medication, following a renal diet, and attending dialysis treatments (Christensen, Smith, Turner, & Cundick, 1994). The focus of this study was on nonadherence to the treatment appointment schedule as defined by skipping and shortening prescribed hemodialysis sessions.

When patients are diagnosed with ESRD they are asked to immediately change their diet and fluid intake, take various medications, and modify their lifestyle to accommodate the hemodialysis treatment schedule (White, 2004). These major life changes are difficult to adhere to and skipping and shortening treatments are common forms of nonadherence to hemodialysis that can have serious negative consequences. Patients who skipped at least one hemodialysis treatment per month were less likely to receive a kidney transplant (Unruh, Evans, Fink, Powe, & Meyer, 2005) and had a 25 percent (Leggat et al., 1998) to 69 percent (Unruh, et al., 2005) higher risk of mortality as compared to adherent patients. On average, 5.4 percent (Gordon, Leon, & Sehgal, 2003) to 33 percent (Dobrof, Dolinko, Uribarri, & Epstein, 2001) of prescribed treatment time was shortened and 7 percent of patients shorten three or more hemodialysis sessions per month (Leggat, et al., 1998). Shortening three or more hemodialysis treatments per month has been associated with a 20 percent increased risk of mortality (Leggat, et al., 1998).

Most studies on skipping or shortening hemodialysis sessions have either examined the prevalence of nonadherence (Dobrof, et al., 2001; Gordon, et al., 2003) or the consequences of nonadherence (Chen, Wu, Wang, & Jaw, 2003; Cohen et al., 2007; Craven, Rodin, & Littlefield, 1988; Cukor, Cohen, Peterson, & Kimmel, 2007; Kimmel et al., 1995; Leggat, et al., 1998; Lopes et al., 2002; Unruh, et al., 2005; Watnick, Kirwin, Mahnensmith, & Concato, 2003). Intervention studies designed to reduce nonadherence have predominately focused on fluid-intake restrictions as the outcome, and only a few studies (Christensen & Johnson, 2002; Tsay, 2003) have demonstrated that a psychosocial intervention improved adherence to the treatment protocol. Two studies that tested a behavior modification intervention found no significant reduction in fluid-intake nonadherence (Welch & Thomas-Hawkins, 2005). An intervention that provided patients with advice and education was not effective in reducing interdialytic weight gain (Casey, Johnson, & McClelland, 2002). Studies that used education interventions found that increased knowledge was not associated with diet (Katz et al., 1998), medication (Long, Kee, Graham, Saethang, & Dames, 1998) or was inversely associated with fluid intake adherence (Molaison & Yadrick, 2003).

Only one published study has attempted to reduce skipped and shortened hemodialysis sessions. Cabness, Miller and Martina (2007) used a single-subject design, referred to as a "one-shot-case study" (p. 49), to examine the effectiveness of a psychoeducational and cognitive behavioral intervention on skipped and shortened hemodialysis sessions. Patients who skipped an average of four or more treatments per month were assigned to the social work intervention group. The mean number of missed treatments decreased between pre-intervention (mean=6.5) and three months post-intervention (mean=2.2). The mean number of shortened treatments decreased from pre-intervention

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(mean=2.5) to three months post-intervention (mean=2.2). This study makes an important and unique contribution by testing an intervention to reduce nonadherence as defined by skipped and shortened sessions. However, the possibility of regression to the mean (Campbell & Stanley, 1963) must be considered when interpreting the reduction in skipped and shortened sessions. Targeting the most treatment-resistant patients may have resulted in a sample with extremely high values on number of missed and shortened sessions. Even if the intervention was not effective, the social work group might have shown improved adherence, due to values on these variables that were more typical at the post-intervention measurement.

Best (2011) and colleagues found that a social work intervention led to fewer missed hemodialysis sessions and improved the reschedule rate. The social work intervention resulted in reducing or eliminating missed treatments in 71 percent of patients. The main reason patients reported missing hemodialysis sessions was due to problems adjusting their lifestyle to their treatment regimen.

Other interventions that improved adherence to treatment protocols shared several characteristics: helping patients accept the diagnosis of a chronic illness, giving patients the opportunity to share their experiences in coping with the treatment regimen, and providing them with the option of individual counseling that emphasized emotional adjustment to the illness (Christensen & Johnson, 2002; Moran, Fonagy, Kurtz, & Bolton, 1991; Tsay, 2003). While these studies provide encouraging results related to other types of nonadherence, the effects of a psychosocial intervention on skipped and shortened hemodialysis sessions has not been tested using an experimental design.

In the current study, a quasi-experimental nonequivalent groups design was used to test the efficacy of a psychodynamic therapy intervention on adherence to hemodialysis (Campbell & Stanley, 1963). This psychodynamic intervention was delivered by a nephrology social worker to provide direct support to ego functioning, thereby contributing to the patient becoming an active participant in his/her treatment. It was postulated that these changes would lead to psychological adjustment to the disease and the treatment protocol and result in increased adherence to hemodialysis treatment (Cukor, et al., 2007; Gilbar, Or-Han, & Plivazky, 2005).

STUDY HYPOTHESES

As compared with patients who received usual care, patients who received the psychodynamic intervention have:

1. fewer skipped hemodialysis sessions;
2. fewer minutes of shortened hemodialysis sessions;
3. smaller percentage of total time that hemodialysis sessions are both skipped and shortened.

METHODS

Procedure

A quasi-experimental design (Campbell & Stanley, 1963) was used to investigate the effects of a psychodynamic intervention on nonadherence to the hemodialysis treatment prescription. Patients were assigned to the intervention or comparison group based on the time of day that they received hemodialysis treatment. Patients who received hemodialysis during weekday hours were assigned to the intervention group because the social worker who administered the intervention was available during these hours. Patients who received nocturnal hemodialysis treatment, approximately 9:00 PM to 6:00 AM, were assigned to the comparison group.

Participants

The study population was adult hemodialysis patients at an outpatient hemodialysis center with an active caseload of almost 200 patients. The inclusion criteria were: skipped an average of at least one hemodialysis treatment or shortened an average of three hemodialysis treatments per month during the Pre-Treatment Phase; spoke English; was sufficiently cognitively intact to participate in the intervention; resided in the community rather than a long-term care facility; and did not require the assistance of a home attendant for more than eight hours per day. Patients residing in a nursing home or who had extensive attendant hours were ineligible because they were not likely to be making independent decisions about treatment adherence. Shortening treatment was defined as terminating a hemodialysis treatment session prior to the prescribed duration by at least 15 minutes. Eligible patients were identified by reviewing both the computerized medical record and the patient hemodialysis treatment flow sheets.

Eligible patients were invited to participate in the study by one of the two study social workers prior to or during their hemodialysis appointment. Patients were told that the purpose of the study was to learn whether it was helpful to patients to have the opportunity to meet with a social worker to receive extra support. If the patient expressed an interest in participating all information necessary for informed consent was provided to the patient. Signed consent was obtained at the first interview. Of the 23 patients who met the eligibility criteria, 21 were enrolled. The response rate was 91 percent. The study was approved by the Fordham University Institutional Review Board.

Ego Psychology Theory

The components of the psychodynamic intervention, which will be described directly below, were based on ego psychology theory. Ego psychology comprises a related set of theoretical concepts that focus on the ego and its capacity to cope with and adapt to changed circumstances (Wallerstein, 2002). Perhaps the most important and significant task that is required of the medically ill patient is adaptation. The ego, in theory, has certain functions that should allow it to adapt, such as intention, mastery, pur-

pose, planning, and control of psychological and emotional behavior (Pine, 1990). If one or more of the ego functions is impaired, this could lead to maladaptation.

It is believed that in nonadherence the patient has found a strategy that gives the impression of serving him/her well by manifestly fostering a sense of control or independence (Cvengros, Christensen, & Lawton, 2004). This is, however, a maladaptive strategy because nonadherence leads to a lower level of functioning and to worse mental and physical health (Mayes, 1994). Many patients are able to adapt to the lifestyle changes because they have sufficient or flexible problem-solving mechanisms or are able to develop a new set of coping skills. Flexibility involves being open to one's inner life; accepting loss, disappointment or anger; and finding acceptable internal solutions (Bird, 1957; Mayes, 1994). For other patients, the diagnosis of a chronic medical condition and its treatment requirements produces an immediate upheaval because they are unable to respond to these painful feelings with appropriate solutions. Instead, defensive reactions, such as excessive levels of denial of the illness and treatment requirements, are mobilized (Fricchione, Howanitz, Jandorf, & Kroessler, 1992; Laplanche & Pontalis, 1974).

The purpose of denial, an ego defense mechanism, is to protect the individual from anxiety by repudiating some or all the meaning of an external event (Moore & Fine, 1994). Denial, however, becomes maladaptive when its use leads to behavior that adversely affects the physical and/or mental health of the individual, as is the case with nonadherence.

Psychodynamic Intervention

The intervention, which was created for the current study and was administered to intervention group patients, used a psychodynamic psychotherapy model based on ego psychology theory. The protocol was to administer one 30-minute therapy session to each patient once a week for twelve weeks. In fact, most patients received fewer than the twelve therapy sessions due to illness, hospitalization, and skipped hemodialysis appointments. The mean number of psychodynamic therapy sessions received was eight.

The therapy sessions were conducted by the first author, whose training was grounded in ego psychology theory and who was the facility social worker. The techniques and components of the intervention were chosen because it was believed that they would facilitate adjustment to hemodialysis. Initially, participants were encouraged to share their experience of living with and adjusting to a serious medical illness, receiving a time-consuming treatment, and the barriers they encountered in doing so. Although the timing of directly talking about the subject of nonadherence was individualized to each patient, common themes included exploring and solving specific difficulties and problems, such as how to cope with multiple medical illnesses, decreased physical functioning, anxiety, depression, fear and interpersonal struggles.

During the course of the intervention, the social worker explored and confronted whichever maladaptive defense was thought to be interfering with treatment adherence. If the patient was making use of excessive denial, this was seen as an obstacle that must eventually be confronted and discussed. Timing was important, however, and discussion of the patient's need to deny the necessity of medical treatment was not introduced until a positive transference was well-established or the patient had some degree of insight into the problem of nonadherence.

Once a confrontation was made and the patient was made aware of his/her need to take an action (skip or shorten a hemodialysis session) to ward off the feelings that hemodialysis treatment engenders (Greenacre, 1950), in subsequent sessions the social worker placed emphasis on acceptance of those feelings that were warded off, such as loss, depression, disappointment or anger. The main goal of the intervention was to help patients become aware of these feelings, struggle with them, and then develop better ways to adapt to them. Once concerns are expressed through language there is less need to act out these feelings (Greenacre, 1950; Rodin, 1984).

One specific technique that distinguished this intervention from the other interventions mentioned in the literature review was the appreciation of the subjectively-useful component of the maladaptive aspect of the need to deny the illness, deny the need for medical treatment, and to take the action of skipping or shortening hemodialysis sessions. Appreciation was not agreement or encouragement of nonadherence, but it fostered sensitivity and allowed the health care professional to get closer to the patient's behavior, to understand it, and learn how to work with the patient in nonadversarial ways (e.g., not getting upset with the patient when s/he was nonadherent). Having the patient feel understood and helping him/her shift between denial and facing the reality of needing medical treatment, facilitated adaptation to the treatment protocol. The effectiveness of the intervention is attributed to this technique.

Usual Care Condition

Comparison group patients received the established protocol for addressing skipped and shortened sessions. This usual care protocol consisted of having a social worker who was part of the health care team at the hemodialysis center meet with each patient three times over three consecutive months to discuss nonadherence and disseminate educational material. These meetings were scheduled to occur during the patient's hemodialysis treatment. Educational material was given and discussed with patients at the end of the first month of nonadherence. At the end of the second month of nonadherence, the social worker attempted to identify the psychosocial barriers to treatment attendance. At the end of the third consecutive month of skipped or shortened sessions, patients were asked five short questions in an attempt to assess their comprehension of the importance of treatment. If a knowledge deficit was identified, patients were

referred to the member of the health care team who could best provide them with additional information and education, such as the physician, dietitian, or head nurse. This protocol specified meeting with each patient three times over three consecutive months, which was comparable to the three-month Treatment Phase for the intervention group. However, because these patients were skipping hemodialysis sessions, dissemination of the material took longer than expected and ranged from three-to-five months.

The goal for this group was to learn about the consequences of skipping or shortening hemodialysis sessions, while the main goal for the intervention group was to help them become more aware and subsequently adapt to deeper, unrecognized feelings that were previously too painful to tolerate and therefore were denied.

MEASURES

Nonadherence to hemodialysis was measured in three ways. All of these measures were obtained from the medical record and patient flow sheet. Each of these measures was calculated for each of the three time periods: 1) the Pre-Treatment Phase (three months prior to the intervention); 2) the Treatment Phase (three months of intervention); and 3) the Post-Treatment Phase (three months following the intervention).

The three types of nonadherence to hemodialysis measures were:

1. *Number of skipped hemodialysis sessions:* This was calculated by adding the total number of prescribed hemodialysis sessions that were missed and were unexcused per study phase, divided by the number of months in that phase. If the patient made up the missed session within the same week, this was not considered a skipped session.
2. *Number of minutes by which hemodialysis sessions were shortened:* This was calculated by adding the total number of minutes of prescribed hemodialysis minutes that were missed due to all shortened sessions and dividing by the number of months in that study phase. Any session that was terminated early by 15 minutes or more, and if the patient did not go to the hospital to complete his/her treatment, was considered a shortened session.
3. *Percent of total minutes missed:* This was calculated by dividing the total number of skipped minutes by the total number of prescribed hemodialysis minutes, multiplying by 100 and dividing by the number of months in that study phase.

There is no gold standard for measuring adherence (Kimmel, et al., 1995). The measures used in this study are highly stable and reliable over time (Kimmel et al., 1998; Kimmel, et al., 1995; Leggat, et al., 1998). Skipped and shortened hemodialysis sessions provide a clear measure of nonadherence because health care providers routinely document a patient's absence and the amount of prescribed treatment time that is

shortened (Denhaerynck et al., 2007; Kimmel, et al., 1998; Kimmel, et al., 1995; Unruh, et al., 2005).

Sociodemographic Characteristics:

The purpose of including sociodemographic measures was: 1) to describe the sample; and 2) to assess the equivalency of the intervention and comparison groups. The sociodemographic measures were collected during the Pre-Treatment Phase and were obtained from the medical evidence report that was completed in the hospital when the patient began a regular course of hemodialysis due to renal failure.

Statistical Analyses

Mixed factorial ANOVA was used to test for differences in nonadherence measures within and between the intervention and comparison groups. The goal of the analysis was to determine whether the two groups differed. Post hoc multiple comparison tests were used to determine whether the intervention and comparison groups differed on each comparison of the three treatment phases (Mertler & Vannatta, 2005). Due to the small sample size, it was not possible to conduct multivariable analyses controlling for the sociodemographic variables. Power was low for many of the analyses in this pilot study.

RESULTS

Sample Characteristics

Thirteen patients were enrolled in the intervention group and eight patients were enrolled in the comparison group. One of the comparison group patients was admitted to a nursing home during the Treatment Phase and was no longer eligible for the study.

The demographic characteristics of the patients are presented in Table 1. The mean age of patients was 44.5 years (SD=11.5), the majority were male (66.7%) and Black (61.5%), followed by Hispanic (23.8%). The most common employment status was retired (38.1%), followed by working full time (33.3%) and not working (19.1%). The mean length of time on hemodialysis was 4.7 years (SD=6.1). There were no significant differences on any of these sociodemographic characteristics or time on hemodialysis for the intervention and comparison groups.

Mean Differences Between the Two Groups

During the Pre-Treatment Phase there were no significant differences between the intervention and comparison group on number of skipped hemodialysis sessions and percent of total minutes missed. Table 2 shows that the intervention group had more early terminated minutes (107.0) as compared to the comparison group (18.1 minutes) due to two patients in the intervention group who were outliers on this variable. Two analyses were conducted to examine the optimal method for handling this. In the first analysis, the actual values were included; in the second analysis, the mean value for the intervention group was substituted for these high values. Both methods yielded the same conclusions and the original values were used in all analyses reported here.

Table 1. Sample Characteristics

CHARACTERISTICS	TOTAL		GROUP				P value
	N	Percent or Mean (SD)	INTERVENTION		COMPARISON		
			n	Percent or Mean (SD)	n	Percent or Mean (SD)	
Age	21	44.49 years (11.52)	13	44.55 (12.3)	8	44.38 (10.9)	.97
Gender							
Male	14	66.67%	7	53.85%	7	87.50%	.17
Female	7	33.34%	6	46.15%	1	12.50%	
Ethnicity							
Black	13	61.90%	8	61.54%	5	62.50%	.42
Hispanic	5	23.81%	4	30.77%	1	12.50%	
White non-Hispanic	2	9.52%	1	7.69%	1	12.50%	
Asian	1	4.76%	0	0.0%	1	12.50%	
Employment Status							
Retired	8	38.10%	6	46.15%	2	25.0%	.79
Full time	7	33.34%	4	30.77%	3	37.50%	
Not working	4	19.05%	2	15.38%	2	25.0%	
Part time	2	9.52%	1	7.69%	1	12.50%	

During both the Treatment Phase and Post-Treatment Phase, the intervention group was significantly more adherent than the comparison group for number of skipped sessions and percentage of total minutes missed. For example, during the Treatment Phase the intervention group skipped less than one session as compared to the comparison group who skipped 3.5 hemodialysis sessions ($p < .001$). The intervention group missed 8.6 percent of the prescribed treatment time as compared to the comparison group who missed 28.1 percent of total minutes missed ($p < .001$).

Comparisons Between the Study Phases

Pre-Treatment Phase vs. Treatment Phase

For the intervention group, on all outcome measures, there was significant improvement in adherence from the Pre-Treatment Phase to the Treatment Phase (Table 3). For example, there was a significant decline in the number ($p < .01$) of skipped sessions, minutes of sessions shortened ($p < .05$), and percentage of total minutes missed ($p < .001$). The difference in percentage of total minutes missed was 9.6 percent (18.2% in the Pre-Treatment Phase and 8.6% in the Treatment Phase) lower. This represents a twofold improvement in adherence for the intervention group. For the comparison group, on all of the outcome measures, there was no difference in adherence from the Pre-Treatment Phase to the Treatment Phase.

Treatment Phase vs. Post-Treatment Phase

There was no significant improvement for the intervention group from the Treatment Phase to the Post-Treatment Phase on any of the adherence measures. The comparison group had significant improvement in the number of skipped sessions and percentage of total minutes missed from the Treatment Phase to the Post-Treatment Phase. For this group, adherence became worse from the Pre-Treatment Phase to the Treatment Phase, and these improvements from the Treatment Phase to the Post-Treatment Phase largely represent a return to the Pre-Treatment Phase adherence level.

Pre-Treatment Phase vs. Post-Treatment Phase

For the intervention group, on all outcome measures there was significant improvement in adherence from the Pre-Treatment Phase to the Post-Treatment Phase. For example, the difference in the number of skipped sessions was 1.4 percent less (1.9% in the Pre-Treatment and 0.5% in the Post-Treatment Phase) and the difference in percentage of total minutes missed was 12.4 percent less from the Pre-Treatment to the Post-Treatment Phase (18.2% in the Pre-Treatment Phase and 5.8% in the Post-Treatment Phase). Each of these differences represents over a threefold improvement in adherence for the intervention group.

For the comparison group, there was no difference in adherence from the Pre-Treatment Phase to the Post-Treatment Phase for all outcome measures.

Table 2. Mean Differences on Outcome Measure Between Groups by Study Phase

ADHERENCE MEASURE	PHASE	INTERVENTION			COMPARISON			MEAN DIFFERENCE (INT-COMP)	P value for one way ANOVA
		N	Mean	SD	N	Mean	SD		
Number of skipped sessions	Pre-Tx	13	1.92	1.26	8	2.83	0.82	-0.91	.09
	Treatment	12	0.86	0.87	8	3.47	1.47	-2.61	<.001
	Post-Tx	11	0.52	0.67	7	2.52	1.33	-2.0	.001
Minutes of shortened sessions	Pre-Tx	13	107.09	93.01	8	18.13	28.53	88.96	.02
	Treatment	12	55.00	76.09	8	54.32	63.40	0.68	.98
	Post-Tx	11	51.21	70.14	7	64.29	69.63	-13.08	.70
Percentage of total minutes missed from skipped and early terminated sessions	PreTx	13	18.15	10.94	8	22.00	7.09	-3.85	.39
	Treatment	12	8.55	7.21	8	28.11	11.32	-19.56	<.001
	Post-Tx	11	5.77	6.99	7	20.95	10.56	-15.18	.002

Table 3. Comparisons Between Study Phases within Each Group

ADHERENCE MEASURE	PHASE		MEAN DIFFERENCE (Column A – Column B)	
	Column A	Column B	INTERVENTION (N = 13)	COMPARISON (N = 8)
Number of skipped sessions	Pre-Tx	Treatment	1.06**	-0.64
	Treatment	Post-Tx	0.34	0.95*
	Pre-Tx	Post-Tx	1.4**	0.31
Minutes of shortened sessions	Pre-Tx	Treatment	52.09*	-36.19‡
	Treatment	Post-Tx	3.79	-9.97
	Pre-Tx	Post-Tx	55.88**	-46.16
Percentage of total minutes missed from skipped and early terminated sessions	Pre-Tx	Treatment	9.60***	-6.11
	Treatment	Post-Tx	2.78	7.16*
	Pre-Tx	Post-Tx	12.38**	1.05

‡<.1, *<.05, **<.01, ***<.001

DISCUSSION

These results suggest that the psychodynamic intervention was effective in reducing nonadherence as defined by skipped and shortened hemodialysis sessions. For the intervention group, on all outcome measures, there was significant improvement in adherence from the Pre-Treatment Phase to the Treatment Phase and from the Pre-Treatment Phase to the Post-Treatment Phase. Nonadherence continued to decline from the Treatment Phase to the Post-Treatment Phase, but not significantly. It is extremely likely that there were no significant differences between the Treatment Phase and Post-Treatment Phase due to low statistical power to test for these differences (power =.05 for each outcome measure).

Nonadherence did not decline in the comparison group. The established protocol that provided educational materials and helped patients understand the psychosocial barriers to treatment attendance did not effectively reduce nonadherence. Consistent with prior research (Molaison & Yadrick, 2003), there was an increase in nonadherence. The increase in nonadherence in the comparison group was expected. Patients are nonadherent for a reason; if the underlying meaning behind the nonadherence is not understood this type of acting out behavior will not change. Patients who suffer from chronic disease have been educated about the importance of adherence from the onset of their condition and may not want to be lectured about this at a time when they are most likely not ready to change. Education about the reasons to receive a full hemodialysis treatment may have been heard as a demand to be adherent. When per-

sonal freedom, the freedom of nonadherence, is perceived to be taken away, that behavior (nonadherence) becomes even more desirable (Cvengros, et al., 2004). This has been referred to as the 'boomerang effect' (Cvengros, et al., 2004).

There were several limitations to this study and the results must be interpreted with these in mind. The number of patients who participated in the study was very small (n=21) and the sample was selected from a single site, which limits the generalizability of results to other hemodialysis patients. There were differences in the amount of hemodialysis prescribed for the intervention and comparison groups. Intervention group patients received, on average, four hours of hemodialysis treatment during the daytime hours and comparison group patients received nine hours of hemodialysis overnight. Aside from the difference in prescription time, the two groups were very similar. For example, there were no significant differences in sociodemographic characteristics and the two groups appeared to be very similar in age, ethnicity, employment status, and length of time on hemodialysis. There is some fluidity between the two treatment modalities and it is not uncommon for patients to alternate between standard and nocturnal hemodialysis based on their schedule, although this did not occur with any study participants. However, without random assignment we cannot rule out the possibility of differences in variables that were not measured, including level of motivation, social support, and other psychosocial factors (Campbell & Stanley, 1963).

During the Treatment Phase, the comparison group received the established protocol for addressing skipped and shortened sessions, which, according to corporation standards, required limited social work education services. It is therefore difficult to rule out the possibility that the reduction in nonadherence was due to a nonspecific or an attention effect rather than the specific techniques that were used in the psychodynamic intervention. Future research should involve a control group that receives social support, but no psychodynamic treatment intervention.

This study was the first to test a psychodynamic intervention, based on ego psychology theory, for nonadherent hemodialysis patients who are skipping and shortening hemodialysis sessions. Although a true experimental design with random assignment was not employed, the quasi-experimental nonequivalent groups design controlled for most threats to internal validity. This study design is stronger (Campbell & Stanley, 1963) than the single-subject design that was used in the one study (Cabness, et al., 2007) that attempted to improve adherence as defined by skipped and shortened sessions.

The clinical significance of the psychodynamic intervention is noteworthy. In the Pre-Treatment Phase, the mean number of skipped hemodialysis sessions was in the clinically problematic range. These patients were less likely to receive a kidney transplant (Unruh, et al., 2005), had a lower standard of living, and had a 25 percent (Leggat, et al., 1998) to 69 percent (Unruh, et al., 2005) higher risk of mortality as

compared to adherent patients. In the Post-Treatment Phase, intervention group patients were no longer in the problematic range (skipping about .5 of a session per month) while the comparison group continued to display poor adherence (skipping 2.5 sessions per month).

There have been few intervention studies testing psychosocial treatments designed to decrease nonadherence and there are even fewer intervention programs that effectively reduce nonadherence. It is important to find an intervention that can reduce nonadherence. The results of the current study offer support that a psychodynamic intervention can reverse the harmful pattern of nonadherence.

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