Effects of Motivational Interviewing and Goal Setting on Albumin Levels in Patients on Dialysis

by

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Effects of Motivational Interviewing and Goal Setting on Albumin Levels in Patients on Dialysis

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Effects of MI on Albumin Level in HD Patients

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Abstract:

Effects of Motivational Interviewing and Goal Setting on Albumin Levels in Patients on Dialysis

Objective: Serum albumin level is a strong predictor of mortality in ESRD patients on maintenance hemodialysis. Although multiple variables affect serum albumin level, studies have shown protein intake interventions can be effective at increasing serum albumin level and have positive effects on mortality outcomes. Motivational interviewing (MI) has shown to be effective in various healthcare settings and its use has been advocated for in ESRD patients, but there is limited evidence on its effectiveness in improving outcomes within this population. SMART goal setting has also been studied in other healthcare settings including rehabilitation, but evidence is limited on its effectiveness in the ESRD population. This study was conducted to explore the effects of motivational interviewing techniques coupled with SMART goal setting on serum albumin levels in patients with ESRD on maintenance HD.

Design: 1-month prospective interventional study design.

Setting: The study was conducted from September 2017 through October 2017 in the Rocky Mount Dialysis Clinic of Fresenius Kidney Care in Denver, Colorado.

Subjects: A total of 9 patients with at least one serum albumin level lab result ≤ 3.5 g/dL from June-August 2017.

Intervention: The 1-month intervention consisted of 3 weekly individual counseling sessions with the dietetic intern utilizing motivational interviewing techniques and SMART goal setting related to protein intake.

Main Outcome Measure: Change in serum albumin level over 1-month intervention period.
Results: This study reports an average change in serum albumin of +0.2 g/dL with a 95% confidence interval of (-0.4174, 0.0174) and a p-value of 0.0667 over a 1-month intervention period.

Conclusion: These results show an average increase in serum albumin level in maintenance hemodialysis patients following a 3-week intervention of nutrition counseling sessions using motivational interviewing and SMART goal setting techniques. Further research in this area should use randomized control designs and larger sample sizes to explore long-term outcomes while controlling for the various etiologies of hypoalbuminemia in this population.

Keywords: motivational interviewing, goal setting, albumin, hemodialysis, protein
Introduction

Patients on maintenance hemodialysis are routinely educated on the renal diet, a complicated and restrictive diet prescription that limits phosphorus, potassium, sodium, and fluid while emphasizing high-protein content. The high-protein aspect of the diet can be challenging for many patients. First of all, appetite tends to decrease over time for patients on maintenance hemodialysis\(^1\). Though the causes of this trend are not clear, lower appetites certainly hinder the ability of patients to meet increased protein requirements. Furthermore, there may be financial barriers, whether perceived or real, in consistently attaining high-protein foods. Moreover, in the early stages of chronic kidney disease prior to renal failure and dialysis initiation, patients are encouraged to consume a low-protein diet to preserve renal function. This transition from low-protein to high-protein can be confusing and difficult among other challenges of dialysis initiation\(^2\). Other contributing factors in low protein intake may include chewing and swallowing difficulties, food access, social support, and comorbidities\(^2\).

Serum albumin level is a strong predictor of mortality in ESRD patients on maintenance HD\(^3\). The etiology of hypoalbuminemia is multifactorial and derives from both malnutrition and inflammation as a result of decreased albumin synthesis\(^4\). Protein intake interventions have been suggested to improve albumin levels and mortality outcomes in ESRD patients with severely low albumin (≤ 3.5 g/dL), but evidence is limited\(^2,4\). Motivational Interviewing (MI) is a collaborative, client-centered counseling style that focuses on strengthening a person’s own motivation and commitment to change\(^5\). The spirit of MI can be described by the following four principles: partnership, acceptance, compassion, and evocation\(^5\). The process of MI involves the following four steps: focusing, engaging, evoking, and planning\(^5\). MI has been shown to be an effective technique in counseling for behavior change in other healthcare fields\(^5\). Russel et al.
showed an improvement in serum albumin level with the use of MI techniques in a pilot study, though the results were not statistically significant\textsuperscript{6}. In this particular study, dialysis staff were trained in motivational interviewing by MI experts during monthly coaching sessions. Russel et al. also demonstrated that 0% of patients reported the use of MI as burdensome or bothersome, and many commented positively on the change in communication style\textsuperscript{6}. Other authors have advocated for the use of MI in the ESRD population based on evidence of efficacy in other healthcare fields, but there has not been extensive research in this\textsuperscript{7,8,9}. SMART goal setting has been shown to be effective in other healthcare fields especially rehabilitation, but there have not been notable studies on the use of SMART goal setting for patients with ESRD on maintenance HD\textsuperscript{10}.

This study evaluates the effect of a combination of MI techniques and SMART goal setting related to protein intake behavior changes on serum albumin level. By incorporating SMART goals in an effort to effect behavior change, this study recognizes the success of goal-setting in other health fields and expands on the work of Russel et al in employing motivational interviewing techniques to encourage behavior change in patients on dialysis. In this study, goal setting is used as a means of fully executing the MI process, fulfilling the fourth step of planning once motivation has been established and the client has reached the appropriate stage of readiness.

Methods

This study used a pre-post design to assess change in serum albumin levels over a 1-month period. All patients were previously diagnosed with ESRD on maintenance hemodialysis at the Fresenius Rocky Mount dialysis clinic located in Denver, Colorado. Patients were selected based
on the following criteria: 1) a serum albumin lab result of ≤ 3.5 g/dL in the 3 months prior to the study; 2) ability to speak and understand English; 3) hemodialysis treatment on Mondays, Wednesdays, and Fridays during the morning or afternoon shifts; and 4) willingness to participate in full 3-week intervention. Nine patients met the first three criteria, and informed consent was provided by all nine patients. The 3.5 g/dL albumin level cutoff was established to match the Lacson et al study as well as the Fresenius standard for qualifying for the ONSP (Oral Nutrition Supplement Program)\(^2\). Monthly labs are collected at this clinic on Wednesdays and Thursdays of the second full week of each month. Thus, pre serum albumin levels were collected September 13-14, 2017 and post serum albumin labs were collected October 11-12, 2017. Lab results were received October 16, 2017.

The intervention included 3 individual weekly counseling sessions conducted by the dietetic intern. Counseling sessions lasted a minimum of 15 minutes and a maximum of 30 minutes. Although all counseling sessions were individualized, there were common elements throughout. Initial sessions began with a nutrition assessment, including collecting a 24-hr diet recall and information involving food access, food preparation, GI symptoms, etc. This was followed with a review of the patient’s most recent albumin lab results and a brief explanation of what albumin is and why it is a measurement of concern for patients on dialysis. Next, patients were provided information on which foods are high in protein, and the intern engaged in discussion about food preferences. The dietetic intern used motivational interviewing techniques including agenda mapping, open-ended questions, summarization, and confidence rulers. Each counseling session took place during the individual patient’s hemodialysis treatment at the Fresenius clinic. Each session concluded by establishing a SMART goal. As described by Wade et al, SMART has had a myriad of meanings in the literature\(^{10}\). In this case, the acronym referred
to a Specific, Measureable, Achievable, Relevant, and Time-bound goal. Subsequent counseling sessions were also individualized, but generally involved a review of information, a discussion of the SMART goal and progress, and an adjustment of the goal as needed. After the final serum albumin levels were determined, each patient had a follow-up meeting with the dietetic intern to discuss progress. During this follow-up meeting, post albumin lab results were provided to patients and discussed.

The biostatistician for the project working with the associated nephrologist of the dialysis clinic conducted all statistical analyses, including analysis of crossover data by mixed effects model. Means and standard deviations were calculated and tested for significance.

**Results**

This study used a convenience sample of 9 patients from the Fresenius Rocky Mount dialysis clinic in Denver, CO. All 9 patients beginning the study continued through until the end of the intervention. Baseline characteristics of the sample are shown in Table 1. Although 33.33% of patients had been on dialysis for less than 6 months, all patients had been on dialysis for at least 3 months prior to the start of the study. Furthermore, all patients had met with a renal dietitian and received education on the renal diet prior to the start of the study. ONSP is the Oral Nutrition Supplement Program that provides one serving of oral nutrition supplement to qualifying patients during hemodialysis treatment. The supplements provided were either Liquacel or Nepro, based on patient preference. Patients qualified for the voluntary program after receiving at least one albumin lab results of 3.5 g/dL or lower. Patients could remain enrolled in the ONSP until they received three consecutive albumin lab results of 4.0 g/dL or higher. Thus, all participating patients qualified, though 2 were not enrolled at the time of study.
The results of the study show an average change in albumin of +0.2 g/dL with a 95% confidence interval of (-0.4174, 0.0174) and a p-value of 0.0667 as seen in Table 2. Thus, this study reports an average increase in serum albumin after three weeks of motivational interviewing and SMART goal setting in patients on dialysis, though the results are not statistically significant. The results report 67% of patients showing improvement, and only 11% of patients showing a decrease in albumin level over a 1-month intervention period. These proportions are reported in Table 3.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sample (N=9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, in years: m (SD)</td>
<td>60.22 (12.28)</td>
</tr>
<tr>
<td>Height, in cm: m (SD)</td>
<td>171.67 (8.63)</td>
</tr>
<tr>
<td>Estimated Dry Weight, in kg: m (SD)</td>
<td>74.33 (12.49)</td>
</tr>
<tr>
<td>BMI, in kg/m²: m (SD)</td>
<td>25.17 (3.39)</td>
</tr>
<tr>
<td>Diabetes Mellitus diagnosis: % of sample</td>
<td>55.56%</td>
</tr>
<tr>
<td>Hypertension diagnosis: % of sample</td>
<td>66.67%</td>
</tr>
<tr>
<td>Patients on dialysis &lt; 6 months: % of sample</td>
<td>33.33%</td>
</tr>
<tr>
<td>Patients on dialysis ≥ 6 months: % of sample</td>
<td>66.67%</td>
</tr>
<tr>
<td>Patients qualifying for ONSP: % of sample</td>
<td>100%</td>
</tr>
<tr>
<td>Patients enrolled in ONSP: % of sample</td>
<td>77.78%</td>
</tr>
</tbody>
</table>

Table 1. Baseline Characteristics of Sample; m = mean, SD = standard deviation

| Mean                                      | 0.2            |
| Standard Deviation                        | 0.2828         |
Table 2. Statistical Analysis of Change in Serum Albumin over 1-Month

<table>
<thead>
<tr>
<th>95% Confidence Interval</th>
<th>(-0.4174, 0.0174)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-value</td>
<td>0.0667</td>
</tr>
</tbody>
</table>

Table 3. Change in albumin over 1-month intervention period.

<table>
<thead>
<tr>
<th>Albumin Change</th>
<th>Number of Patients (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved</td>
<td>6 (67%)</td>
</tr>
<tr>
<td>No Change</td>
<td>2 (22%)</td>
</tr>
<tr>
<td>Decreased</td>
<td>1 (11%)</td>
</tr>
</tbody>
</table>

Each patient set at least one SMART goal during the intervention. In follow-up counseling sessions during weeks 2 and 3, goals were assessed and progress was discussed. If goals were easily met, for example, the dietetic intern generally discussed setting a new SMART goal with the patient in order to continue progress towards meeting protein goals. If goals were far from met, the discussion would be geared towards tweaking the goals as necessary in order to make them realistic and achievable. At the end of each counseling session, patients were left with a basic handout about protein with their own personal SMART goal written in at the bottom. As mentioned previously, the acronym SMART has had many meanings in the literature. Though the meaning is generally consistent, the acronym has been specified in this study to be Specific, Measureable, Achievable, Relevant, and Time-bound. Initial SMART goals were analyzed for content and results are shown in Table 4.

Table 4. SMART goal characteristics.

<table>
<thead>
<tr>
<th>Characteristic of SMART Goal</th>
<th># (%) from sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal specified food or supplement to be consumed</td>
<td>7 (77.78)</td>
</tr>
<tr>
<td>Goal referred more generally to “any protein food”</td>
<td>2 (22.22)</td>
</tr>
<tr>
<td>Goal referred to protein supplement (drink, powders, bars, etc.)</td>
<td>5 (55.56)</td>
</tr>
<tr>
<td>Goal required action on 4 or more days per week</td>
<td>5 (55.56)</td>
</tr>
<tr>
<td>Goal required action on 3 or less days per week</td>
<td>4 (44.44)</td>
</tr>
</tbody>
</table>

Table 4. Analysis of SMART goal characteristics from sample (N=9)

Discussion

Despite a small convenience sample, the results of this study demonstrate a mean improvement in serum albumin of +0.2 g/dL over a 1-month period. Although these results were not statistically significant (p=0.0667), they suggest an improvement in albumin that may be related to the intervention and support a call for further research in the area. These results support the use of motivational interviewing coupled with setting SMART goals by nutrition professionals when working with patients with ESRD on maintenance HD. These results are in line with the those from the Russel et al study, and support the conclusions that MI has potential to enhance adherence in terms of dietary recommendations, specifically protein intake, in this population and setting. The ability to enhance behavior change and subsequently increase serum albumin levels in patients on dialysis has major implications as serum albumin is a known predictor of morbidity and mortality in this population\(^3,12,13,15\). As with the Russel et al study, the study did not have sufficient power to show statistical significance.

Motivational interviewing is an important counseling style used in various health fields, and it appears to have had a positive impact on the patients in this study as seen in the results. In this study, patients tended to gradually open up more with the counselor about food intake, barriers, and motivation after given time to establish trust and rapport. When patients were given the opportunity to speak freely and share personal stories that were not necessarily on topic, the
nutrition conversation benefited immensely. Patients began to disclose more information about their diet including preferences, meal patterns, meal frequency, who cooks their meals, who they eat with, etc. This improvement is likely due to the building of trust and the fact that patients who receive an MI counseling style notice the counselor is listening to them more, as described by Russel et al. Russel et al also makes the noteworthy claim that none of the participating patients described the counseling style as burdensome or bothersome. This claim may initially be met with skepticism, as the counseling style requires spending time in discussion with patients who have come to the clinic for life-sustaining dialysis treatments. However, the current study found that this guiding, collaborative style was met with much less resistance than directive styles, which many patients anticipated. Motivational interviewing strives to establish a partnership through a guiding style, rather than a directive, authoritative style. Thus, it is necessary to allow the patient to guide the conversation, while the counselor actively listens, reflects, and summarizes. Furthermore, the weekly sessions of this study allowed the relationship between counselor and patient to grow and provided talking points for the counselor, building from the previous week. All of this requires extensive time with each patient, and thus may seem challenging to renal dietitians with high patient volumes and extensive responsibilities. However, MI has demonstrated success in situations with time constraints such as emergency room settings. This shows that maintaining the spirit of MI can still improve outcomes of behavior change even if the ideal time for counseling is not available.

It is essential to note that motivational interviewing as a counseling technique hinges on the notion that individuals move through stages of readiness to change before taking action to make a change. The mere fact that all patients who participated in this study agreed to a three-week intervention focused on improving albumin level implies an advanced stage of readiness.
This selection bias may limit the generalizability as this technique may not yield the same results in patients who are less open to change. However, it does show promise as a technique that can provide short-term results for patients who are in advanced stages of readiness. Controlled studies are needed to determine causality of outcomes.

As delineated in Table 3, six patients observed an increase in serum albumin, two patients had zero change, and one patient observed a decrease in serum albumin. A closer look at this single observed decrease in serum albumin level can help direct future research on these counseling techniques. This patient in question appeared highly motivated during the three counseling sessions and discussed her strong attempts to consume high protein foods throughout the day. It was not until the 4th follow-up session after post albumin results were taken that the patient in question reported symptoms of decreased appetite over several weeks. The patient described psychosocial etiologies of this low appetite. It appears that the revelation of an objective decrease in serum albumin level prompted this patient to divulge appetite changes, barriers, and difficulties meeting the protein goals that she had not mentioned in previous discussions. This situation suggests that the intervention could benefit from a study period of multiple months, with monthly monitoring of serum albumin. If negative trends are observed, these results can be discussed with the patient as a part of the counseling sessions and the responses from patients can direct the new goals to be set. This situation also exemplifies the problem of relying too heavily on a single lab value, as these snapshots in time do not provide a full picture of the health of the patient. Since a single albumin measure can be affected by hydration, infection, and other factors, it would be helpful to observe trends in albumin over time with these counseling techniques.
Table 4 displays qualitative data on the types of SMART goals set for each patient. SMART goals were necessarily related to protein intake and set after discussing usual dietary intake. Goals were set by the patient with guidance by the dietetic intern. Once a goal was set, confidence rulers were used to assess the extent to which the goal was “achievable.” The dietetic intern would ask the patient to use a scale of 1-10 to describe how possible the goal sounded to him or her. If the patient responded with a 5 or less, the goal would be adjusted as necessary to ensure it was “achievable.” The characteristics of the goals shown in Table 4 display how most goals (78%) specified the food to be focused on. Only 22% of the goals lacked specificity in the exact food to be consumed, but rather these goals focused on the time or frequency to consume protein foods. Furthermore, 56% of goals referred to protein supplements, demonstrating the importance of these food items in the dialysis population. Protein supplements can be extremely useful for patients with low appetites, strict food preferences, or limited ability to prepare fresh foods. This study lacked the resources to determine and analyze completion of SMART goals. Further research in the use of SMART goals in this population should analyze associations between SMART goal completion and outcomes. Rather, this study focuses on the association between the action of simply setting SMART goals and future outcomes (change in serum albumin level).

When setting SMART goals, it is important to understand that a wide range will exist in the difficulty level of the goal and the anticipated impact. For example, a patient who reports low appetite and lack of access to food until the following month’s income arrives will have a much different goal from a motivated patient who reports a supportive family member willing to cook their meals daily. This is why it is important to meet a patient where they are and work with them through each necessary step to achieve adequate dietary intake. For some, this may simply
require providing renal-friendly recipes for favorite meals. For other patients, this may require applications to non-profits who provide food access aid to low-income individuals and those with chronic illness. Thus, the nature of a SMART goal being “achievable” necessitates that each patient will have highly individualized goals, with highly varying results even if every goal is met.

This study has many limitations that must be considered. First of all, the small sample size, lack of randomized controlled design, and single clinic setting all limit the generalizability of this study. Furthermore, the nature of the techniques used are necessarily individualized and highly dependent on both the counselor (dietetic intern in this case) and the patient being counseled. MI inherently depends on the stage of readiness for change of the patient and thus progress will depend on this. Progress will also depend on the skill and level of training of the counselor utilizing the MI techniques. Moreover, this study does not control for other factors that affect albumin level. Hypoalbuminemia is significantly associated with low protein/energy intake, but other relevant factors in this etiology include inflammation, dialysis-associated catabolism, uremia, infection, metabolic derangements, and various comorbidities\textsuperscript{11,16}. Since so many factors influence this lab result, albumin should be monitored as a trend over time, rather than a single observation to inform care. Another relevant factor is the Oral Nutrition Supplement Program (ONSP), in which many participating patients were enrolled. Although this could have been a factor in the resulting change in albumin, no patient initiated enrollment during the month of the study. Thus, both pre and post albumin levels were measured while patients had access to protein supplements.

This study also has many strengths. First, all counseling sessions were administered by a single dietetic intern, thus decreasing variability in the quality of intervention received by each
patient. A study using multiple health professional counselors would surely support a higher sample size, but the intervention would lose uniformity. Furthermore, using serum albumin as the outcome measure ensures objectivity and accuracy, rather than a measure of protein intake such diet recalls, which are subject to inaccuracies and recall bias. Moreover, this study pairs motivational interviewing with SMART goal setting, expanding on the work of other researchers working with MI and ESRD. The explicit use of SMART goals ensures the final step of the MI process can be executed fully and provides a topic for follow-up discussion and continued, consistent counseling sessions.

Motivational interviewing has been shown to be effective in many health fields. This study supports current research suggesting that it may be a useful technique in the dialysis setting, though still fails to show statistical significance. Other studies have demonstrated that patients report no burden from receiving this intervention. Future research in this area should be aimed at larger samples using randomized controlled study designs. Results should be teased out to control for other factors influencing albumin. In assessing the effect of SMART goal-setting, studies should assess extent to which patients are meeting these goals and how this correlates with improvement in nutrition markers. Future studies should extend the duration of the intervention. As this study showed with the one patient who observed a decrease in serum albumin, monitoring serum albumin throughout the intervention period and discussing results with patients may help illuminate barriers that would not otherwise be discussed. Ultimately, studies should look at long-term outcomes of mortality associated with these techniques.

Conclusions

This study supports the findings of similar research on motivational interviewing. The results show an improvement in serum albumin of +0.2 g/dL in maintenance hemodialysis
patients after a 3-week intervention of motivational interviewing and SMART goal setting. The findings from this study can help inform practice by health professionals, especially renal dietitians. This research supports taking the time to build partnerships and trust with patients using a guiding style to evoke change talk. Patients should be assisted in setting realistic and relevant goals, and confidence rulers can be used in counseling sessions to help the counselor assess the extent to which goals are achievable. Health professionals are advised to consider the stage of readiness to change for each individual and meeting the patient where they are. It is also important to remember that the lab values attained so frequently in clinical settings, especially dialysis clinics, are mere snapshots and markers. Each value should be monitored as one data point in a trend, and professionals should remember that lab values will never reveal all necessary information about a patient. It is also beneficial for health professionals to follow up frequently with patients, rather than the typical monthly schedule seen in many dialysis clinics. Frequent meetings allow the dietitian or other professional to address problems as they arise and adjust goals as needed. They also allow for the patient to feel valued and maintain commitment to change. Finally, health professionals in this field should continue to follow emerging research in this field as best practices in counseling and behavior change are elucidated and refined.
References


