

The Effect of the SystemCHANGE™ Intervention on Systems Thinking in a Randomized Controlled Trial of Kidney Transplant Recipients: A Secondary Data Analysis

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BACKGROUND & SIGNIFICANCE

- 36 of every 100 patients who undergo kidney transplants are non-adherent to their medications (Dew et al., 2007).
- Traditional approaches focused on knowledge through education, attitude through counseling, and behavior through skills training to improve medication adherence have had marginal success (Easthall et al., 2013; Nieuwlaat et al., 2014).
- SystemCHANGE™ Intervention is a cost effective, personal systems focused approach that significantly improves medication adherence-both statistically and clinically (Russell et al., 2020).
- SystemCHANGE™ Intervention encompasses education about Systems Thinking (Russell et al., 2016).
- Systems thinking is defined as “a process applied to individuals, teams, and organizations to impact cause and effect where solutions to complex problems are accomplished through collaborative effort according the personal ability with respect to improving components and the greater whole” (Statler et al., 2016, p. 323).

PURPOSE

The purpose of this study was to conduct a secondary data analyses to evaluate the effect of the SystemCHANGE™ intervention compared to the attention-control intervention on systems thinking in adult kidney transplant recipients. The effect of systems thinking on medication adherence was also evaluated.

METHODS

- Secondary data analysis of systems thinking, demographic, and medication adherence variables from a single-blinded (participants), 2-arm randomized controlled trial.
- The intervention group received the 6-month SystemCHANGE™ Intervention and attention-control group received 6 month education intervention.

MEASURES

- Systems Thinking Scale (Dolansky & Moore, 2013).
 - 20-item Likert Scale.
 - Measures perceptions of personal system behaviors.
 - Reliable and valid (test-retest 0.74 & Cronbach Alpha 0.89).
- Medication Adherence
 - Average 6 month immunosuppressive medication rate defined as dose taken on time divided by total doses.
 - Medication Event Monitoring System Smart Cap® (Medication Event Management System®, MEMS Track Cap; Aprex Corp., Union City, CA, USA).

RESULTS

| Variable | N=80 N (%) * |
|---------------------------|-----------------|
| Gender | |
| Male | 44.3 (55.4) |
| Female | 32.8 (41) |
| Age | |
| Mean | 51.72 |
| Range | 20-79 |
| Ethnicity | |
| Black or African American | 50 (60.2) |
| Caucasian | 29 (34.9) |
| Multiracial | 1 (1.2) |
| Education | |
| Some high school | 4 (4.8) |
| High school | 21 (25.3) |
| Some college | 29 (34.9) |
| College graduate | 26 (31.3) |
| Marital Status | |
| Married | 44 (53) |
| Divorced | 16 (19.6) |
| Never married | 16 (19.6) |
| Living with someone | 2 (2.4) |
| Widowed | 2 (2.4) |
| Employment | |
| Employed full-time | 28 (33.7) |
| Employed part-time | 8 (9.6) |
| Disabled | 29 (34.9) |
| Unemployed | 6 (7.2) |
| Retired | 9 (10.8) |

RESULTS cont.

- Cronbach alpha, computed for the Systems Thinking Scale was 0.908.
- No significant correlations between demographic variables and system thinking scores.
- No significant differences on pre and post mean scores between groups (p=.056).

| Intervention | Mean Pre (SD) | Mean Post (SD) |
|--------------|------------------|------------------|
| Yes | 3.5683 (0.63863) | 3.6293 (0.66877) |
| No | 3.5726 (0.53388) | 3.6726 (0.67066) |

- There was no statistically significant correlation between post intervention medication adherence and system thinking at 6 or 12 months (r=.079, p=0.526 and r=.067 0.591 respectively).

Discussion

- To change Systems Thinking knowledge participants may need higher dose of SystemCHANGE™ education.
- SystemCHANGE™ intervention was efficacious without a change in participant knowledge of the process which could be due to guidance by the interventionist.

IMPLICATIONS FOR NURSING

- Efficacy of the SystemCHANGE™ Intervention without a change in systems thinking knowledge.

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