Interpersonal Caring Theory: An Empirical Test of Its Effectiveness Utilizing Growth Curve Analysis — II

Susie Kim1*, APRN, DNSc, FAAN, Sue Kim2, RN, PhD, NP

1President, Seoul Cyber University, Seoul, Korea
2Assistant Professor, Department of Family Health Management, College of Nursing, Nursing Policy Research Institute, Yonsei University, Seoul, Korea

Purpose To test the impact of interpersonal caring theory empirically on six major psychosocial functioning outcomes of persons with serious mental illness.

Methods This was a quasi-experimental pre- and post-test design with data collection from a total of 266 patients with long-term serious mental illness, who were diagnosed with schizophrenia spectrum disorder and followed at 6-month intervals over a 24-month period in three groups: a community psychiatric service group, a community service with interpersonal caring intervention group, and a control group. Three hypotheses between the intensity, specificity, and longitudinality of services were tested using growth curve analysis.

Results Hierarchical linear modeling supported associations of hypotheses between the intensity, specificity, and longitudinality of services and improved patient outcomes.

Conclusion This study suggests that the intensity, specificity, and longitudinality of interpersonal caring interventions in community psychiatric service programs deserve attention in order to improve and maintain patient functional outcomes. [Asian Nursing Research 2007;1(3):187–198]

Key Words independent living, interpersonal caring, interpersonal relationship, quality of life, self-esteem

INTRODUCTION

Traditionally and up to the mid 1990s, the Korean government’s mental health policy was focused on the expansion of large-scale, national or public and private mental hospitals. Only in recent years (1995) has the government realized the importance of community psychiatric services (CPS) for persons with serious mental illness (SMI) that link hospitalization to normal social life in the community. The goals of CPS are to break the cycle of readmission and to increase the psychosocial functioning and community integration of mentally vulnerable persons. CPS come in various types, forms, and organization of the services they offer. The findings on other psychosocial outcomes have not been as consistent,
with studies finding CPS to be either superior or no better than usual care in terms of independent living, social and occupational functioning (Bond, McGrew, & Fekete, 1995; Scott & Dixon, 1995; Test, 1992). In this regard, Olsson (1990) stated that the challenge for future research on CPS is to understand the conditions under which these services achieve superior functional outcomes. A critical aspect of this effort concerns delineating the service delivery or program process, which are related to client outcomes (Brekke & Test, 1992; Solomon, 1992; Taube, Morlock, Burns, & Santos, 1990). However, in searching for the conditions under which functional outcomes can be maximized in CPS, several issues are notable.

First, most studies have compared CPS with usual community care; there have been very few comparisons of different types of CPS (Scott & Dixon, 1995; Solomon, 1992). Second, it has been argued that successful community interventions should be organized according to several service principles, which will then be reflected in certain service characteristics (Bachrach, 1992; Test & Scott, 1990). In fact, almost no studies have measured actual service implementation (Brekke & Test, 1992; McGrew, Bond, Dietzen, & Salyers, 1994). As a result, it has not been possible to empirically assess the characteristics of their service delivery. Thus, the absence of both comparative outcome designs and program implementation data in CPS research has precluded tests of how particular service characteristics affect client outcomes. Nonetheless, there are several service characteristics that have been discussed as potentially important for effective CPS. Three of them are intensity, specificity, and longitudinality (Bachrach; Brekke & Test; Torrey & Drake, 1994). The principle of intensity suggests that more intense services are better than fewer services. Specificity refers to the need for services targeting the specific areas where functional change is desired. This is based on the notion that the generalization of change across functional domains is not likely to occur during rehabilitation in persons with SMI (Bachrach; Test, 1981). Finally, longitudinality suggests that because these disorders are going to present clients with long-term challenges, the service must be available in an ongoing fashion (Bachrach; Test & Scott). Longitudinality has also been taken to imply that the termination of services will result in the loss of rehabilitative gains for the individual. In this regard, some studies found that once services ended, the functional gains made by chronically mentally ill individuals were lost (Scott & Dixon).

As can be seen, there has been very little study of the association between service characteristics and functional outcomes in CPS. This study sought to compare prospective patient outcomes over 24 months from two CPS that empirically varied on the intensity, specificity, and longitudinality of their services, and one control group.

**BACKGROUND OF STUDY**

**Conceptual model**

On the basis of a multiphase series of studies (Ha, Kim, Kim, & Park, 1997; Kim, 1989, 1997a, 1997b, 1998a; Kim & Ae, 1999; Kim & Berry, 1997; Kim, Lee, Lee, & Yang, 1997; Lee & Lee, 1997; Lee, Lee, Yang, & Kim, 1997; Yang, Yu, & Lee, 1998; Yoo, Lee, Ae, & Cha, 1997), the interpersonal caring theory (ICT) was developed and tested empirically (Kim, 2000, 2002). The study results supported the effect of ICT and its 10 domains of caring: noticing, participating, sharing, active listening, complimenting, comforting, hoping, forgiving, and accepting (Kim, 1998a, 1998b; Kim & Kim, 2007; Kim et al., 1998). Through a series of integrated and replicated studies, it was clear that self-esteem was directly influenced by interpersonal caring interventions for the patient, which, in turn, affected self-care, daily living skills and social functioning, and subsequently influenced interpersonal relationships and quality of life (QOL) of persons with SMI (Kim, 2002).

Figure 1 presents a schematic diagram showing how nursing interventions that apply ICT influences patients’ rehabilitation as a whole (Kim, 2002). It shows that interpersonal caring service interventions
raise a patient’s self-esteem, which in turn enhances independent living (composite of self care, daily living skills, and social functioning), motivating patients to undertake relationships with others more intentionally, and improving QOL.

Hypotheses
1. The intensity hypothesis ($H_1$): the structured CPS (CP) group and structured CPS with interpersonal caring intervention (IC) group would have higher rates of improvement than the control (C) group (without any CPS program) in self-esteem, independent living, interpersonal relationships, QOL, readmission rates, and length of hospitalization over time. The outcome curves for the CP and IC groups were expected to be positively linear or quadratic, or a combination of the two. The C group was expected to show minimal change in any outcome area.

2. The specificity hypotheses ($H_2$): (a) the IC group would show greater positive linear or quadratic curves in self-esteem, independent living, interpersonal relationships and QOL, as well as a lower number of readmission and shorter length of hospitalization over time than the CP group; (b) in terms of the six outcome variables over time, both groups would show a positive linear or quadratic curve, but the IC group would have a steeper slope than the CP group.

3. The longitudinality hypothesis ($H_3$): In-treatment times for CP and IC group participants would show positive linear or negative quadratic curves in all patient outcome domains, and out-treatment times would show negative linear or positive quadratic curves in these domains.

METHODS

Research design
This study employed a quasi-experimental pre- and post-test design with data collection at 6-month intervals over a 2-year period.

Setting and samples
Korean adult patients with a diagnosis of schizophrenia spectrum disorder attending one of three CPS sites in Seoul were recruited via convenience sampling. These centers provided CPS, managed by psychiatric-mental health nurse practitioners, targeting patients’ psychosocial and functional domains of living. Study participants were persons with SMI living in the community who had a history of hospitalizations at government funded long-term psychiatric hospitals or sanatoria for a period of 3–9 months per year. Participants were in one of three groups: CP group ($n = 186$), IC group ($n = 60$), and C group ($n = 20$). Due to the difficulty of matching demographic variables of the CP and IC groups, only 20 patients were secured for the C group.

Measures
Owing to difficulty in finding instruments appropriate for the given population and culture, several Western and Korean instruments were pilot tested and items with high reliability were selected for the study. Measures included self-esteem (Rosenberg, 1965), self care (Yoo, 1991), daily living skills (Jun, 1994; Kim, Lee, Lim, & Kim, 1997), social functioning and interpersonal relationship (Kim, 1997a), and QOL (Lee et al., 1997). Statistical analyses showed
these measures were reliable with acceptable Cronbach’s alpha levels of .87 for self-esteem, .88 for independent living, .92 for interpersonal relationship and .85 for QOL.

**Procedures**

Participants in the CP and IC groups received 12 weeks of intensive training on self-care, daily living skills and group socialization. Thirty-nine kinds of conventional CPS activities were provided to participants of both CP and IC groups during the study period. These CPS rehabilitation programs targeted rehabilitative changes in psychosocial functioning with onsite monitoring of medication, crisis management to prevent hospital readmission, ongoing supportive services, etc. The primary goals were to keep patients in the community and provide them with optimal levels of care and maintenance of normal life. The IC group received the same kinds of conventional CPS activities with specific service interventions of noticing, participating, sharing, active listening, companionship, complimenting, comforting, hoping, forgiving, and accepting (Kim & Kim, 2007) by 10 primary nurses. They were trained and secured the satisfactory face validity. The IC group also had service continuums in strengthening the subject’s competence in terms of his/her talents (singing, dancing, playing, storytelling, writing, gardening, working, etc.). Subjects in the C group did not participate in any of these CPS programs.

Approval from the university’s research and ethics committee was obtained before initiation of the study. Following an explanation of the study purpose, procedure, and confidentiality and anonymity of the study by the researchers, participants were asked to sign the consent form.

**Analyses**

In this study, there was interest in only one covariate, program type. The central question was whether this covariate was responsible for systematic differences in growth curve rate (i.e., the magnitude of the slope) and type (i.e., whether the curve was linear or quadratic), or a combination of the two. Linear and quadratic curves were chosen for modeling for several reasons. First, these two types of curves are the ones most commonly fit for psychological research (Cliff, 1987). Second, we wanted to be as descriptive as possible by including linear (straight-line) change and nonlinear (quadratic) change for each individual. Third, it was also assumed that linear and quadratic curves would be interpretable in the context of clinical change; that is, a linear trend indicating an individual’s scores continually going up (or down) as a function of time. In contrast, a quadratic trend indicates that an individual’s scores go up and then down (a negative curve) or down and then up (a positive curve) as a function of time.

The linear and quadratic growth curves at Level 1 were regressed on orthogonal polynomial transformations of time (see Kirk, 1995, p. 191). This was to ensure that the Level 1 “predictors” (i.e., time and time squared) were uncorrelated. The orthogonal polynomials were also centered at the first time point, so that the intercept reflected predicted status at Time 1. After Level 2 equations were computed, tests of significance for slope rate, type or curve, and program type were evaluated for each of the dependent variables related to the hypotheses based on the premises of ICT.

**RESULTS**

**Participants**

The participants of the study consisted of 266 Korean adults with SMI between the ages of 22 and 55 years with schizophrenia or schizoaffective disorder: 157 men (59.02%) and 109 women (40.98%). Their mean age was 36.6 ± 9.0 years, and they had an average of 14.05 years of illness (range, 9 months – 44 years). Their baseline psychiatric severity, as measured by the Brief Psychiatric Rating Scale (Overall & Gorham, 1962), was 43.8 ± 13.4, which is similar to that of SMI patients without CPS follow up. The mean number of admissions per year was 13.06 times and the average length of hospitalization was 231.98 days per year.

Due to a quasi-experimental comparative outcome design, assessing the equivalence of the groups
at baseline on demographic and functional variables was essential (Table 1). In general, the groups were equivalent at baseline on the variables examined, aside from age and gender, i.e., the IC group was somewhat younger than the CP and C groups and consisted of fewer women than the CP group.

Participants were also examined by attrition rates. At 6 and 12 months, 89% of participants were retained, which dropped slightly to 87% at 18 months and 86% at 24 months. There were no statistically significant differences in study attrition rates across groups. At 24 months, 79% remained in the CP group while 90% remained in the IC group. We also compared study completers at 24 months \((n=224)\) to study dropouts \((n=42)\) on gender, length of illness, and the six baseline outcome variables, but no differences were found.

### Treatment services
Following Brekke and Test’s (1992) guidelines, CP and IC groups were compared on the intensity and specificity of their services. For service intensity during the first 6 months of the program in terms of nurse/staff–patient contact, the IC group averaged over 24 hours/month during its 3-month training period, which dropped to about 16 hours/month afterwards. The CP group averaged about 16 hours/month of nurse/staff–patient contact during the first 3 months and then dropped to about 8 hours/month after that. Clearly, the IC group had more intense programs than the CP group.

Concerning specificity, it was found that 27% of the nurse/staff–patient contacts in the IC group were personal competence in the participant’s talent focusing on vocational area, whereas less than 1% of

---

### Table 1

**Comparison of 266 Participants at Baseline**

<table>
<thead>
<tr>
<th>Characteristics and variables</th>
<th>CP ((n=186))</th>
<th>IC ((n=60))</th>
<th>C ((n=20))</th>
<th>(\chi^2) or (F) (and dfs)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>105</td>
<td>38</td>
<td>14</td>
<td>(\chi^2) (2) = 8.4</td>
<td>.049</td>
</tr>
<tr>
<td>Female</td>
<td>81</td>
<td>22</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosis of SMI (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenic disorder</td>
<td>142</td>
<td>48</td>
<td>12</td>
<td>(\chi^2) (2) = 0.68</td>
<td>.993</td>
</tr>
<tr>
<td>Schizoaffective disorder</td>
<td>32</td>
<td>12</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years), mean (SD)</td>
<td>38.3 (9.2)</td>
<td>34.5 (7.4)</td>
<td>37.1 (10.4)</td>
<td>(F(2, 263) = 6.9)</td>
<td>.001</td>
</tr>
<tr>
<td>Outcome variables, mean (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-esteem (composite scores)</td>
<td>1.32 (1.95)</td>
<td>1.35 (1.85)</td>
<td>1.37 (1.35)</td>
<td>(F(2, 263) = 2.7)</td>
<td>.103</td>
</tr>
<tr>
<td>Independent living</td>
<td>2.34 (1.43)</td>
<td>2.32 (1.66)</td>
<td>2.21 (1.48)</td>
<td>(F(2, 263) = 1.4)</td>
<td>.228</td>
</tr>
<tr>
<td>Self-care</td>
<td>2.53 (1.54)</td>
<td>2.65 (1.98)</td>
<td>2.41 (1.92)</td>
<td>(F(2, 263) = 0.9)</td>
<td>.532</td>
</tr>
<tr>
<td>Daily living skills</td>
<td>2.94 (1.43)</td>
<td>2.69 (1.75)</td>
<td>2.60 (1.24)</td>
<td>(F(2, 263) = 1.4)</td>
<td>.221</td>
</tr>
<tr>
<td>Social functioning</td>
<td>1.67 (1.31)</td>
<td>1.63 (1.26)</td>
<td>1.61 (1.29)</td>
<td>(F(2, 263) = 1.9)</td>
<td>.198</td>
</tr>
<tr>
<td>Interpersonal relationship</td>
<td>1.62 (1.68)</td>
<td>1.56 (1.72)</td>
<td>1.58 (1.71)</td>
<td>(F(2, 263) = 2.2)</td>
<td>.116</td>
</tr>
<tr>
<td>Quality of life</td>
<td>2.63 (1.84)</td>
<td>1.89 (1.97)</td>
<td>2.41 (1.88)</td>
<td>(F(2, 263) = 1.5)</td>
<td>.214</td>
</tr>
<tr>
<td>Number of hospital admissions/year</td>
<td>12.96 (9.25)</td>
<td>13.30 (8.43)</td>
<td>12.80 (8.84)</td>
<td>(F(2, 263) = 2.9)</td>
<td>.092</td>
</tr>
<tr>
<td>Length of hospitalization in days/year</td>
<td>227.15 (24.5)</td>
<td>236.81 (25.5)</td>
<td>220.72 (28.4)</td>
<td>(F(2, 263) = 2.4)</td>
<td>.129</td>
</tr>
</tbody>
</table>

CP = community psychiatric services group; IC = community psychiatric services with interpersonal caring intervention group; C = control group; SMI = serious mental illness.
the contacts in the CP group were vocational, with a statistically significant difference. Concerning number of readmissions and length of hospitalization, both groups showed notable improvements; the IC group had significantly lower results than the CP group. Because the C group did not involve any CPS, it was not included in the analyses on specificity.

In terms of longitudinality, patients could exit both CP and IC groups at any time after coming to the program. However, most of the participants remained in the study protocol, and this provided a basis for the analyses on longitudinality.

**Functional outcomes across the three programs**

Each hypothesis was tested by examining the intercept (initial status), linear and quadratic coefficients for statistical significance, and for group differences in change curves. When directional hypotheses were tested, one-tailed tests of statistical significance were reported (Kim, 1998b, 2002), and effect size was noted to assess the practical implications of rejecting the null hypothesis (Friedman, 1968).

**Service intensity (H<sub>i</sub>)**

The intensity hypothesis was tested by using the complete sample from the three groups regardless of whether patients had exited them as well as by using only participants who remained in the CP or IC group at each time point.

**Predicted growth curves using the complete sample**

Self-esteem: Figure 2 presents the predicted growth curves for each group on self-esteem using the whole sample. There was no Group x Intercept (initial status) interaction, suggesting that the three groups were identical at baseline. The linear slope was significant and positive, t(263) = 4.5, p < .001, whereas the quadratic slope was significant but showed a negative trend. There was also significant Group x Linear Slope interaction, t(264) = 3.3, p < .001. The linear slope coefficients were .23 for the CP group, .33 for the IC group, and .06 for the C group. Participants in both CP and IC groups showed much improvement in self-esteem, whereas those in the C group showed declining trend over time.

Independent living: The Group x Intercept interaction was not statistically significant. The linear slope was significant and positive, t(263) = 2.4, p < .01, but the quadratic slope was not significant. There was significant Group x Linear Slope interaction, t(263) = 2.3, p < .01, with a significantly positive quadratic slope, t(263) = 1.7, p < .05. The linear slope coefficients were .16 for the CP group, .32 for the IC group, and .01 for the C group. The quadratic coefficient was .12 for the C group. The results indicated that whereas CP and IC groups showed significant improvement, participants in the C group declined over time (Figure 3).

Interpersonal relationships: Figure 4 presents the predicted growth curves for each group on interpersonal relationship. There was no Group x Intercept interaction. The linear slope was significant and
positive, \( t(263) = 2.7, p < .005 \), but the quadratic slope was not significant. There was Group \( \times \) Linear Slope interaction, \( t(264) = 4.5, p < .001 \), and the linear coefficients were .20 for the CP group, .33 for the IC group, and .04 for the C group. Figure 4 indicates that the CP and IC groups improved in interpersonal relationship whereas the C group declined over time.

QOL: There was a significant Group \( \times \) Intercept interaction (Figure 5), suggesting that CP was the highest group at baseline, \( t(264) = 2.3, p < .01 \). The linear slope was significant and positive, \( t(263) = 2.6, p < .005 \), and there was also a significant Group \( \times \) Linear Slope interaction, \( t(264) = 2.6, p < .005 \). The linear coefficients were .07 for the CP group, .39 for the IC group, and .01 for the C group. The quadratic term was not significant, but Quadratic Slope \( \times \) Group interaction was significant, \( t(264) = 2.5, p < .05 \). The quadratic coefficients were –.01 for the CP group, –.04 for the IC group, and .015 for the C group. These results suggest that over the study period, QOL declined in the C group but improved in the CP and IC groups.

Readmission rates: With regard to the number of readmissions, there was a significant Group \( \times \) Intercept interaction, \( t(264) = 5.1, p < .001 \), suggesting that CP was the highest at baseline. The linear slope was significantly negative, \( t(263) = -3.0, p < .002 \), while the quadratic slope was significantly positive, \( t(263) = 2.3, p < .01 \). There were also significant Group \( \times \) Slope interactions for both linear, \( t(264) = -3.2, p < .002 \), and quadratic slopes, \( t(264) = 2.4, p < .01 \). The linear slope coefficients were .04 for the CP group, .12 for the IC group, and –.01 for the C group. The quadratic coefficients were –.02 for the CP group, –.03 for the IC group, and –.01 for the C group. As shown in Figure 6, participants from the CP and IC groups showed a significant decrease in the number of readmissions over time, whereas those in the C group showed no decrease.

Length of hospitalization: Figure 7 shows the predicted growth curves for each group for length of hospitalization. There was no significant Group \( \times \) Intercept interaction, suggesting that the three groups were identical at baseline. The linear term was significant and positive, \( t(263) = 3.2, p < .02 \), and there was also a significant Group \( \times \) Linear Slope interaction, \( t(264) = -2.6, p < .05 \). The linear...
coefficients were .43 for the CP group, .45 for the IC group, and .28 for the C group. The quadratic term was also significant, \( t(263) = -3.6, p < .001 \), with significant Quadratic Slope × Group interaction, \( t(264) = 3.1, p < .025 \). The quadratic coefficients were –.01 for the CP group, –.04 for the IC group, and .015 for the C group. These results suggest that although all three groups improved, IC participants showed the shortest length of hospitalization over the study period.

Thus, the results using the whole sample largely supported the intensity hypothesis. As hypothesized, the outcome curves for the CP and IC groups were positively linear, and that for the C group showed minimal change in all outcome variables.

The effect sizes of these findings ranged from .23 (self-esteem) to .39 (dependent living), with an average across the six domains of .29.

**Predicted growth curves using in-treatment participants**

The second set of intensity analyses used only the patients who remained in treatment at each time point. In terms of all variables, the findings on the in-treatment participants were essentially the same as for the whole sample but were statistically stronger. Concerning self-esteem, number of readmissions and length of hospitalization, all of the slope and Group × Slope interactions were significant at \( p < .001 \). The mean linear coefficients were .15 for the CP group, .31 for the IC group, and –.02 for the C group. The quadratic coefficients were –.01 for the CP group, –.04 for the IC group, and .02 for the C group. Both CP and IC groups showed much improvement in all variables and maintained positive change from baseline over 2 years. The effect sizes for these analyses ranged from .17 (hospital days) to .34 (self-esteem), with an average across the six domains of .24.

Thus, the in-treatment participants at each time point also provided support for the intensity hypothesis with more consistent results than the results of the analysis with the whole sample. This could suggest that treatment has a greater impact on self-esteem, interpersonal relationship, number of readmissions and length of hospitalization than on independent living and QOL.

**Specificity of services (Hs)**

The hypotheses on specificity were tested using data from the CP and IC groups combined as well as separately at each time point. For the hypothesis concerning self-esteem, the findings from the complete sample indicated that there was a significant linear slope, \( t(244) = 6.3, p < .005 \), and a significant Group × Slope interaction, \( t(245) = 4.8, p < .025 \). The quadratic coefficients were .06 for the CP group and .04 for the IC group. Figure 8 presents predicted self-esteem scores using only in-treatment participants. The findings were similar and stronger than results of the analysis with the complete sample concerning the quadratic slope, \( t(244) = -11.9, p < .001 \), and Group × Slope interaction, \( t(145) = 8.4, p < .001 \).
but there was also a trend toward significance for the overall linear coefficient, \( t(244) = 3.4, p < .08 \). The linear coefficients were .14 for the CP group and .34 for the IC group, and the quadratic coefficients were .01 for the CP group and −.045 for the IC group.

This pattern was repeated for the remaining five outcome variables as well, with findings similar to and stronger than the slopes and Group × Slope interactions from the complete sample (data not presented due to restricted length of manuscript).

The effect sizes for specificity on self-esteem, independent living, interpersonal relationship, QOL, number of readmissions, and length of hospitalization averaged .18, with a range from .15 (self-esteem) to .20 (QOL) for the whole sample, and averaged .37, with a range of .33 (self-esteem) to −.41 (QOL) for the in-treatment sample.

In summary, the specificity hypotheses were supported as the IC group showed significantly more improvement in all six outcome variables than the CP group, which showed less change over time.

**Longitudinality of services (H1)**

In terms of self-esteem, the in-treatment linear coefficient was positive, \( t(244) = 4.7, p < .001 \), and the quadratic coefficient was negative, \( t(244) = -6.5, p < .001 \). For out-treatment times, although the average linear slope was negative (−.02) and the average quadratic slope was positive (.02) according to the hypothesized direction, neither was statistically significant. The lack of statistical significance for out-treatment times was likely due to the low statistical power because the reliability of the parameter estimates was low and the estimates of the variance components were not statistically significant. Nonetheless, it appears that the significant gains made during treatment attenuated once participants exited treatment.

In terms of independent living, the in-treatment and out-treatment mean linear slopes were positive (.05 and .02), and both mean quadratic slopes were negative (−.02 and −.001), although none of the coefficients was statistically significant. This suggests that although both groups improved over time while in treatment, these gains were not lost once they exited treatment. Concerning interpersonal relationship, the in-treatment mean linear slopes were positive (.02 and .04) and both mean quadratic slopes were negative (−.03 and −.02), although none of the coefficients was statistically significant. This suggests that although both groups improved over time while in treatment, these gains were not lost once they exited treatment.

In terms of interpersonal relationships, the linear slope was positive with evidence of a trend, \( t(244) = 3.4, p < .001 \), and the quadratic slope was negative and statistically significant, \( t(244) = -10.9, p < .001 \). Although the average linear slope during out-treatment times was negative (−0.9) and the average quadratic slope was positive (.02), reflecting the hypothesized direction, neither was statistically significant. The lack of statistical significance for out-treatment times was likely due to the low statistical power because the reliability of the parameter estimates was low and the estimates of the variance components were not statistically significant. These results suggest that interpersonal relationship gains made in treatment began to attenuate once participants exited treatment.

Concerning QOL, the linear slope was positive, \( t(244) = 3.7, p < .001 \), and the quadratic coefficient was negative, \( t(244) = -2.5, p < .01 \). For out-treatment times, although the mean linear slope was negative, \( t(244) = -1.7, p < .05 \), the mean quadratic slope was positive, \( t(244) = 1.9, p < .05 \), according to the hypothesized direction.

Concerning number of readmissions during treatment, the linear slope was positive, and the quadratic slope was negative. The quadratic slope was statistically significant, \( t(244) = -4.5, p < .001 \), and the linear slope showed evidence of a trend, \( t(244) = 1.4, p < .09 \). The mean linear slope during out-treatment times was negative (−.09) and the mean quadratic slope was positive (.02), and although these were in the hypothesized direction, neither was statistically significant. As was the case for self-esteem scores, these results suggest that while the number of readmissions decreased in treatment, it began to attenuate once the patient exited treatment.
For length of hospitalization, the average in-treatment and out-treatment linear slopes were positive (.03 and .02). The program participation quadratic slope was negative (−.03) and the dropout slope was positive (.02). Although none of these slopes were statistically significant due to low statistical power, it appears that significant decrease in length of hospitalization during treatment was not changed when patients exited treatment.

The effect sizes of the statistically significant findings on longitudinality ranged from .22 (self-esteem) to .46 (independent living) and averaged .33.

In summary, there was some support for the longitudinality hypothesis, i.e., improvements gained in self-esteem, interpersonal relationships, QOL, number of readmissions, and length of hospitalization, with treatment gains attenuating once patients exited treatment. The evidence for independent living, however, did not clearly support the longitudinal hypothesis.

DISCUSSION

Mental health problems are more serious among the economically underprivileged than others in Korea. For example, on average, the morbidity rate was twice as high among economically poor segments of the society and a large number of economically underprivileged mental patients were at home without proper treatment or care (Suh, 1998). Therefore, it was imperative to develop easily accessible, cost-effective alternative services that offer effective mental health care as well as useful social rehabilitation programs for the mentally ill. One solution was to establish CPS programs with intense caring perspectives designed to break the vicious cycle of revolving door hospitalizations and to increase the psychosocial functioning and community integration of these vulnerable individuals (Lee & Lee, 1997).

There are three important implications of these findings. First, investing in more intense well-structured interpersonal caring services is advisable to improve patient outcomes. This implies that intensive services would benefit from focusing on particular functional domains to improve patient functioning, such as focusing on self-esteem to improve the patient’s perception of his/her own strength and competence. Second, when patients stop treatment, they begin to lose the functional gains on self-esteem, interpersonal relationship and QOL they had achieved. This underscores the need for CPS to be provided as an ongoing service that is focused on intensity, specificity and longitudinality to maintain positive functional change. Third, the clinical significance of this study in terms of scales and effect size is noteworthy. For example, the change in the number of readmissions and length of hospitalization presented in this study ranged from none to hospitalization for less than 6 weeks during a 6-month period, which has great implications for cost.

CONCLUSION

For all three hypotheses of intensity, specificity and longitudinality, the IC group showed the greatest positive linear relationship with steeper slope in self-esteem, independent living, interpersonal relationship and QOL, as well as a lower number of readmissions and shorter length of hospitalization over 24 months. This study provides further empirical support for the effectiveness of ICT and suggests that the intensity, specificity and longitudinality of interpersonal caring services in CPS programs deserve attention in order to improve and maintain patient functional outcomes.

REFERENCES

Brekke, J. S., & Test, M. A. (1992). A model for measuring the implementation of community support
Empirical Testing of Interpersonal Caring Theory


