

Research Article

The Effects of a Multidisciplinary Methodology to Assist Individuals with Multiple Chronic Conditions

Christina Miles Krause^{1*} and Maria EJ Kuhn²

¹Department of Psychology, Aurora University, USA

²Benefit Performance Associates, USA

***Corresponding author**

Krause C, Department of Psychology, Aurora University, 20 N. Lincoln, Batavia, Illinois, USA, Tel: 630-677-2231;

Fax: 630-761-4430; Email: ckrause05@gmail.com

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- Disease management program
- Intervention program
- Integrated health advocacy program

Abstract

The present study examined the effects of the Integrated Health Advocacy Program® (IHAP®), a disease management program, to determine if it has a positive impact on the long-term management of healthcare for individuals with multiple chronic conditions (MCC). Typically the individuals have three to ten medical conditions and within their benefit plan they are in the 20% of the cohort who utilizes 80% of the total claim dollars. The intervention is paced to be a three to five year commitment involving an extensive review of medical history, extensive interviews with participants and monthly team meetings. This process also includes setting up realistic goals with each of the participants and collaborating with each of the participants' current health care providers. The program is voluntary.

The theory applied to this research project is Bandura's self-efficacy work in that it is expected that an increase in self-efficacy will result in many health benefits (1997). The goal of this research was to specifically determine if the intervention process of empowering individuals by setting realistic goals and working collaboratively with their IHAP team will result in an improvement in their level of self-efficacy, as well as in the health and wellbeing of the participants. The results indicate that the participants did improve their self-efficacy and their physical, psychological and mental health functioning, their social functioning, their level of vitality, their perceptions of personal control, and in life satisfaction, as well as an increase in their health-related activities (e.g., preparing questions for their health-related appointments and asking the questions). Therefore, the intervention appears to have a positive effect on individuals dealing with multiple, chronic conditions.

INTRODUCTION

The main contributor to soaring health care costs in the United States is the presence of multiple chronic conditions (MCC) in individuals [1,2]. Individuals with MCC account for approximately 80% of healthcare expenditures (Benefit Performance Associates, 2002, as cited in [3,4] and individuals with MCC are rapidly increasing as our society ages [5]. The challenge has been how to provide adequate and cost-effective healthcare services to these individuals [2]. These individuals may be a burden to a primary care provider due to the complexity of their ongoing need for continuous health care from numerous medical and behavioral health specialists. [6] found that 20% of U.S. respondents who had chronic health conditions were prescribed duplicate medical tests or procedures and that "30% of US respondents indicated that their physicians had not taken

the time to review their current medications with in the last two years" [7].

Individuals who experience several health conditions simultaneously, and who have healthcare issues that are complex, are at risk for inadequate care [8]. The numbers of these individuals with MCC use more healthcare services, as well as a greater variety of services, with additional healthcare costs, as compared to individuals who are not dealing with these issues [9]. As the number of chronic conditions increases, so do the issues of duplication of tests, emergency room visits, drug reactions, increase in the number of hospital stays [10] and more missed work days [11]. Also, individuals with MCC have been found to have higher rates of psychological issues, such as anxiety and depression [12,13]. Furthermore, important psychological issues, such as self-efficacy, having social support, and a more

positive reassessment of life's priorities [14], life purpose and life satisfaction [15], and coping strategies [16], have not been consistently emphasized in the care of these individuals. To summarize, much of the healthcare in the United States results in a lack of whole-person care, placing these individuals at risk for future complications of their health issues and wellbeing.

Researchers recently have found web-based interventions to have inconsistent effects across conditions [17,18], also there is some debate regarding the effectiveness of telephonic programs, which usually have focused on a single healthcare condition [9].

The Integrated Health Advocacy Program® (IHAP®), a voluntary disease management intervention program, was initiated as an intervention for individuals with MCC by providing a case management strategy specifically for this population's needs. The participants collaborate with a uniquely trained multidisciplinary team (comprised of physician, nurse and psychosocial professional) who serve as a liaison between the individual and his/her primary care physician and other specialized providers See Figure (1). To address the needs of the individuals in terms of their physical and psychological issues, all obtainable medical records are collected and reviewed for life-long patterns to create an individualized, comprehensive multidisciplinary healthcare plan. The plan is created in with the collaboration of each individual participant, establishing goals that are suitable with his/her current abilities, in order to improve health conditions as well as increase his/her level of self-efficacy through ongoing decision support and self-management education. This strategy of ongoing support, as well as including the participant as an equal partner of the IHAP team, was expected to impact their health, their level of life satisfaction, and their level of satisfaction with healthcare services.

This project was reviewed by an Institutional Review Board at Aurora University prior to starting the data collection process. More than five hundred individual have participated in the IHAP intervention program since 2002 [13].

METHODS

Data was utilized from 514 participants who volunteered for the intervention and had taken whole-person assessments at the beginning of the program (Time 1) and after one year in the program (Time 2). The researchers also examined the responses of the participants who had been in the program for at 1 ½ years (Time 3) when exploring the data. The individuals signed up for the program at different times during the years 2002 to 2015. The individuals who participated were employees or their dependents at various hospitals, corporations, companies, cities, medical centers and included a university and school district located in the Midwest.

After the individuals signed a consent form, the various whole-person assessments were administered to examine the participants' wellbeing including the: Self-Efficacy for Managing Chronic Disease Scale [19]. Short form SF-36 [20]; Perceptions of Control Questionnaire [21]; the Multidimensional Health Locus of Control Assessment [22]. Medical Care Questions [19] and the Life Satisfaction Scale [23]. Data was collected on site by the IHAP team servicing the participant; the members of the team received training on the data collection process.

A form for rating the quality of the healthcare program, as compared to previous healthcare treatment (The Revised Client Satisfaction Survey), was mailed to participants from the primary researcher with a letter indicating that their IHAP team would not see their responses, and that only the averages of the participants would be reported to their IHAP team. Enclosed in the letter and the survey was a stamped envelope to mail the survey form back to the researcher.

RESULTS

Statistical analyses, ANOVAs with post-hoc *t*-tests, were used to examine the participants' responses across time while in the intervention program. All data was examined as percentages,

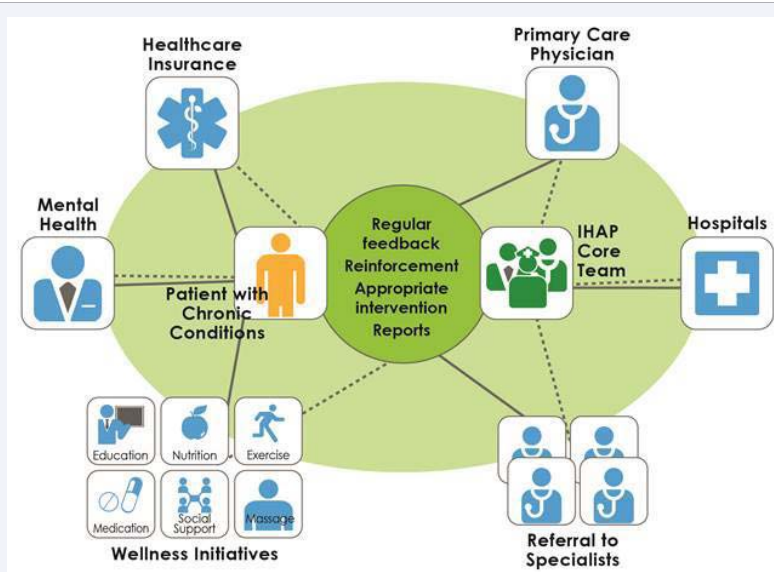


Figure 1 IHAP Care Management: The graph displays the relationships that the IHAP team has with the IHAP participants and their service entities, and indicates the wellness initiatives.

as the number of questions differed creating differences in scales. Higher percentages on all measures reflect more positive responses.

All results were based on a .05 level of significance. Post hoc paired samples *t*-tests were conducted holding the *p* value at .05 for all of the follow-up analyses to examine a significant ANOVA. There are fewer individuals who have taken the Time 3 assessments, as compared to the Time 2 assessments; therefore, when comparing the mean of Time 2 to the Mean of Time 3 there is a decrease in the number of participants, as compared to Time 1 and Time 2 comparisons.

Health locus of control

To examine ratings of six questions regarding 33Self Efficacy over health conditions repeated measures ANOVA was conducted. The results indicate there was a change over time in the rating of their Self Efficacy, $F_{(1,9,734)} = 36.273, p < .001$. Post hoc paired-sample *t*-tests indicate there is an increase in the ratings of Self Efficacy from Time 1 (.563) to Time 2 (.644), $t_{(483)} = -8.768, p < .001$. There is no significant change from Time 2 (.640) to Time 3 (.642), $p > .025$, which indicates that the increase remained stable from Time 2 to Time 3. (Note. The *p* value was held at .05 for 2 tests, therefore, $p = .025$.)

Medical care questions

The participants' ratings of their ability to discuss healthcare issues with their providers was measured with a composite score of three questions (prepares a list of questions, asks questions, discusses personal problems related to health conditions). A repeated measures ANOVA was conducted which indicated a change in their ability to discuss issues across time, $F_{(2,544)} = 30.244, p < .001$. Post hoc paired sample *t*-tests were conducted to examine this change. The results indicate that there is an increase from Time 1 (Mean = .611) to Time 2 (Mean = .656), $t_{(350)} = -4.496, p < .001$. However, there is no significant change in their reported ability to discuss issues from Time 2 (Mean = .663) to Time 3 (.681) $p > .025$.

Sf-36 results

To examine the level of physical functioning from the SF-36, which included questions on life activities such as lifting groceries, climbing stairs, bending, walking, bathing and dressing one self, repeated measure ANOVA was conducted. This analysis was used to examine the participants' responses regarding their physical functioning across time. The results indicate that there is a change in physical functioning across time, $F_{(1,76,674.6)} = 5412.96, p < .001$. The post hoc paired samples *t*-tests indicate that there is a significant increase from Time 1 (Mean = .537) to Time 2 (Mean = .600), $t_{(478)} = -6.320, p < .001$. However, there is no difference between Time 2 and Time 3, $p > .025$. The lack of change indicates that the increase at Time 2 was stable at Time 3.

To examine participants' rating of Vitality on the SF-36, which was measured by five questions (having pep and energy, as well as not being worn out, and not tired), a repeated measures ANOVA was conducted across time. The results indicate that there is a change in physical functioning across time, $F_{(2,592)} = 35.6, p < .001$. Post hoc paired *t*-tests were conducted and indicate that there is

a significant increase from Time 1 (Mean = .353) to Time 2 (Mean = .434), $t_{(477)} = -7.817, p < .001$. No difference was found between Time 2 and Time 3, $p > .025$.

To examine the participants' Social Functioning level on the SF-36 (social time, social extent) a repeated measures ANOVA was conducted across time. The results indicate that there is a change in Social Functioning across time, $F_{(2,594)} = 6.637, p = .001$. The post hoc paired *t*-tests indicate that there is a significant increase from Time 1 (Mean = .627) to Time 2 (Mean = .688), $t_{(477)} = -4.756, p < .001$. There is no significant difference between Time 2 and Time 3, $p > .025$, again signifying the stability of the increase at Time 2.

A repeated measures ANOVA was conducted to examine the participants' responses to five questions regarding their level of Mental Health (peaceful, happy and not sad, nervous, or down in the dumps) on the SF-36 across time. The results indicate that there is a change in Mental Health across time, $F_{(1,9,740.94)} = 15.380, p < .001$. The post hoc results indicate that there is a significant increase in Mental Health from Time 1 (Mean = .632) to Time 2 (Mean = .675), $t_{(478)} = -5.182, p < .001$. No difference was found between Time 2 and Time 3, $p > .025$.

No other variables were examined on the SF-36.

Perceptions of Control Questionnaire

The next step was to examine the participants' responses on the Perceptions of Personal Control Questionnaire® (PPC). The first measure was Physical Functioning which was a composite of five questions (weight, exercise and healthy meals, as well as 2 questions regarding the status of their health). A repeated measures ANOVA was conducted to examine participants' ratings of their level of Physical Functioning across time. The results indicate a significant change over time, $t_{(2,413)} = 116.135, p < .001$. Post hoc paired samples statistics were conducted to examine this change. There was a significant difference between the participants' ratings of their health from Time 1 (M = .437) to Time 2 (Mean = .518), $t_{(516)} = -11.727, p = .001$. Also, there is a significant increase from Time 2 (M = .515) to Time 3 (.547), $t_{(413)} = -5.263, p < .001$, indicating that their ratings regarding their physical functioning improved across time.

To examine ratings of Mental Functioning on the PPC a repeated measures ANOVA was conducted on a composite total of six questions (rating of mental health, ability to cheer up, being in charge of emotions, and reverse scoring depression, anger and experiencing mental lapses). The results indicate there was a change over time in their rating of Mental Functioning, $F_{(2,413)} = 9.911, p < .001$. Post hoc tests paired samples *t*-tests indicate there is an increase in the ratings of Mental Functioning from Time 1 (.513) to Time 2 (.533), $t_{(516)} = -3.882, p < .001$. However, there is no significant change from Time 2 (.531) to Time 3 (.536), $p > .05$, which indicates that the increase was stable from Time 2 to Time 3.

A repeated measures ANOVA was conducted to examine ratings of Social Functioning on three questions (comfort with amount of socializing, with number of friends, and with one's self when socializing). The results indicate there was a change across time, $F_{(2,413)} = 5.025, p < .01$. There is no difference in the

ratings of Social Functioning from Time 1 (.501) to Time 2 (.509), $p > .025$. However, there is a significant increase from Time 2 (.502) to Time 3 (.527) showing that the participants reported an improvement in their Social Functioning after 1 ½ years in the program, $t_{(413)} = -3.237, p = .001$.

To examine the participants' ratings of the control of others and their own personal control over 16 areas of their lives a 2 (Control Type: Others, Self) x 3 (Time: Start of program, 1 year later, 1 ½ years later) ANOVA was conducted with repeated measures on Control Type and Time. The results indicate a Main Effect of Control Type, $F_{(1, 412)} = 348.86, p < .001$. The main effect was qualified by a Control Type by Time interaction, $F_{(1, 9, 527)} = 4.427, p = .012$. Using post hoc analyses holding the .05 level for two t -tests indicated that across time the participants' perception of Control by Others did not change from Time 1 (Mean = .416) to Time 2 (Mean = .404), $p > .025$. Again, using the .025 p value for the second post hoc test, no change was found from a mean of Control by Others at Time 2 (Mean = .403) to Time 3 (Mean = .415), $p > .025$. However, Control by Self increased from Time 1 (Mean = .774) to Time 2 (Mean = .834), $t_{(516)} = -8.695, p < .001$. The participants' reported level of Control by Self did not change from Time 2 to Time 3, $p > .025$, indicating that the increase in their perception of control by self at Time 2 did remain consistent.

No other variables were examined on the PPC.

Life satisfaction questionnaire

A repeated measures ANOVA was conducted to examine ratings of Life Satisfaction on 13 questions (scale 0 to 26) across time. The results indicate there is a change across time, $F_{(1, 8, 516)} = 13.028, p < .001$. There is an increase in the rating of Life Satisfaction from Time 1 (.544) to Time 2 (.601), $t_{(366)} = -5.330, p < .025$. However, there is no significant increase from Time 2 (.601) to Time 3 (.602), $p > .025$, indicating that the increase did remain stable across time.

Client satisfaction survey

Participants rated their level of satisfaction with their healthcare services before the intervention program and with the IHAP intervention program using a scale of 1 (*quite dissatisfied*) to 4 (*very satisfied*) one year after starting IHAP. The results indicate that participants that responded to the mailed document rated their healthcare services with the program as more effective in helping them deal with their conditions (Mean = 3.60), as compared to their previous healthcare services (Mean = 2.42), $t_{(270)} = -19.468, p < .001$. Furthermore, they rated the quality of services received with IHAP (Mean = 3.71) as higher than the quality of services received before joining IHAP (Mean = 2.48), $t_{(267)} = -22.084, p < .001$. Finally, the respondents indicated that the services they received with IHAP did help them to deal more effectively with their problems (Mean = 3.76), as compared to their services before IHAP (Mean = 2.48), $t_{(269)} = -25.629, p < .001$.

DISCUSSION & CONCLUSION

The use of a 3-5 year multidisciplinary disease management program provided the support of a team of multidisciplinary professionals who worked with the participants to help them overcome barriers that would normally interfere with their

healthcare compliance. The process of collecting and reviewing all obtainable health records and collaboratively preparing a specialized healthcare plan along with communication and support from their team appears to have resulted in the participants increasing their level of self-efficacy in being able to manage their health issues. Self-efficacy is an important self-concept that is related to having more success in improving their health [14]. The participants also reported an increase in their level of life satisfaction, social functioning and in their physical and psychological wellbeing. They also reported that their healthcare was more satisfying and more effective with IHAP, as compared to previous healthcare.

This comprehensive whole-person approach did result in many positive outcomes.

Since the number of individuals with multiple health issues has been increasing rapidly, it is important for intervention programs to assist these individuals. In response to the questionnaire asking about the quality of their care previous to the intervention and with the IHAP program, many of the individuals added very positive notes about their experiences in the program and indicated that they were grateful for their IHAP team.

One of the limitations of this study was that all the data was reported by the participants across time. Another limitation was that the individuals who participated came predominately for the Midwest section of the United States. One strength was the evidence that the participants did report that over time they did gain benefits both psychologically and physically. Another strength was the extent of the population in that they were employees of various hospitals, companies, corporations, urban areas, rural areas and medical center, as well as from a university and school district.

One relevant and thoughtful reflective statement that relates to the approach of IHAP is from Edward S [24]: "Medicine is failing because it is designed on the infectious disease model in which a single drug or intervention could 'cure' and save lives. Most diseases being treated by healthcare today are not amenable to single purpose cures in that most pathology is due to chronic diseases. And, chronic diseases can only be addressed if the client is, in fact, actively engaged in the healing process and that the individual is supported by a team of individuals committed to providing the tools and knowledge necessary for the individual to heal." IHAP is meeting that challenge by providing a pathway to better health by having each participant become fully engaged in the process of planning a unique health plan and by having a team of professionals who provide ongoing support and encouragement to each participant.

CONFLICT OF INTEREST

Dr. Krause is the Director of Research for the study and has not received any financial gain from examining the data. Maria Kuhn is the Clinical Director of Benefit Performance Associates, who coordinates the training of the IHAP teams. She has not received any financial gain from examining the data.

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