

COLLABORATION BETWEEN DISCIPLINARY TEAMS CARING FOR ELDER
IN KOREAN COMMUNITY SETTINGS

by

Kyung Hee Lim

Copyright © Kyung Hee Lim 2008

A Dissertation Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

2008

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the Dissertation Committee, we certify that we have read the dissertation prepared by Kyung Hee Lim

entitled COLLABORATION BETWEEN DISCIPLINARY TEAMS CARING FOR
ELDERS IN KOREAN COMMUNITY SETTINGS

and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy

_____ Date: April 15, 2008

Deborah Vincent, PhD, APRN, BC, FAANP

_____ Date: April 15, 2008

Joyce A. Verran, PhD, RN, FAAN

_____ Date: April 15, 2008

Cathy L. Michaels, PhD, RN, FAAN

_____ Date: April 15, 2008

Linda R. Phillips, PhD, RN, FAAN

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

_____ Date: April 15, 2008

Dissertation Director: Deborah Vincent, PhD, APRN, BC, FAANP

STATEMENT BY AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at The University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this dissertation are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the copyright holder.

SIGNED: Kyung Hee Lim

ACKNOWLEDGMENTS

My Doctorate of Philosophy journey was arduous, but richly rewarding, more than I expected. This endeavor and this dissertation would have not happened without the support of many people. While I extend my sincere appreciation to all who contributed, I would like to specifically thank those whose unique efforts developed and sustained my progress. My committee deserves special accolades, for without their valuable assistance this research could not have been completed. Dr. Deborah Vincent, my dissertation chair, consistently supported me and provided her knowledge and direction to my completing this dissertation. Her comments and suggestions helped me in organizing my thoughts and making the best decisions for how to progress. Dr. Joyce Verran provided huge and deep knowledge, expertise and wisdom in theory, methodology, and analysis. Whenever I struggled with something in this research, she always guided me in the right direction. Dr. Cathleen Michaels provided her expertise in community-based nursing programs for my dissertation and provided great emotional support during my PhD journey. Dr. Linda Phillips, my minor committee chair, provided expertise in gerontology for this dissertation.

Special thanks should be given to my friend, Dr. Beverly Rosenthal. She gave me great help reviewing all my papers and this dissertation and her thoughtful suggestions added to the quality of my papers and dissertation quality. My deepest gratitude is extended to my family and friends (Drs. Kwak, Jung, and Lim, Miran, Kyunghye), who offered ongoing encouragement when I was disheartened and depressed. Lastly, I thank God who always protects and guides me in reaching my destination.

DEDICATION

To my mother and father and Reverends Moon and Han, who continually encouraged and guide me to pursue goals in life.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS	9
LIST OF TABLES	10
ABSTRACT	11
CHAPTER 1: BACKGROUND AND SIGNIFICANCE.....	13
Importance of Collaboration for Elders in Community Settings	13
Definition of Collaboration in the Healthcare Work Environment	17
Theoretical Framework for Collaboration	20
Research Significance.....	23
Purpose and Aims	26
Summary	27
CHAPTER 2: CONCEPTUAL FRAMEWORK.....	28
System Research Organizing (SRO) Model	28
Hypothesized Collaboration Model and Variables	34
<i>Team Member</i>	36
<i>Context</i>	38
<i>Collaboration Process</i>	43
<i>Degree of Collaboration</i>	46
Summary	47
CHAPTER 3: METHODOLOGY	49
Research Design.....	49
Research Settings	49
Research Samples	50
Human Subjects and Recruitment of Subjects.....	52
Measures	53
<i>Team Member</i>	53
<i>Beliefs in the benefits of collaboration</i>	53
<i>Perception toward other professions</i>	55
<i>Individual ability</i>	57
<i>Prior collaboration experience</i>	57
<i>Context</i>	58
<i>Organizational structure</i>	58
<i>Team resources</i>	59
<i>Leadership</i>	60
<i>Collaboration Process</i>	61

TABLE OF CONTENTS – *Continued*

<i>Degree of Collaboration</i>	63
<i>Additional Descriptive Data</i>	64
Study Procedures	65
Data Collection	65
<i>Individual and Team Data Collection</i>	65
<i>Organizational Data Collection</i>	66
Data Analysis	66
<i>Individual Level Analysis</i>	66
<i>Team Level Analysis</i>	67
<i>Statistical Analysis</i>	68
Summary	69
CHAPTER 4: RESEARCH FINDINGS.....	70
Sample Characteristics.....	70
Variables at Individual Level in the Hypothesized Model	72
<i>Team Member</i>	72
<i>Beliefs in the benefits of collaboration</i>	72
<i>Perception toward other professions</i>	74
<i>Individual ability</i>	74
<i>Prior collaboration experience</i>	75
<i>Context</i>	75
<i>Organizational structure</i>	75
<i>Team resources</i>	76
<i>Leadership</i>	76
<i>Collaboration Process</i>	77
<i>Degree of Collaboration</i>	78
Variables at the Unit Level in the Hypothesized Model.....	80
Results of Hypothesis Analysis	84
<i>Hypothesis One</i>	84
<i>Hypothesis Two</i>	87
Summary	90
CHAPTER 5: DISCUSSION.....	91
Constructs in the Hypothesized Model.....	91
<i>Team Member</i>	92
<i>Beliefs in the benefits of collaboration</i>	92
<i>Perception toward other professions</i>	92
<i>Individual ability</i>	93
<i>Context</i>	94
<i>Organizational structure</i>	94
<i>Team resources</i>	95

TABLE OF CONTENTS – *Continued*

<i>Leadership</i>	97
<i>Collaboration Process</i>	99
<i>Degree of Collaboration</i>	100
Research Hypotheses	101
<i>Hypothesis One</i>	101
<i>Hypothesis Two</i>	104
Study Implications and Limitations	108
<i>Implications for Further Research and Practice</i>	108
<i>Study Limitations</i>	110
Summary	111
APPENDIX A: FLYER	114
APPENDIX B: SUBJECT DISCLAIMER FORM	116
APPENDIX C: SURVEY INSTRUMENTS	118
REFERENCES	131

LIST OF ILLUSTRATIONS

FIGURE 1. Hypothesized Collaboration Model.....	35
FIGURE 2. Revised Collaboration Model.....	79
FIGURE 3. Path Analyses	86
FIGURE 4. Final Collaboration Model	89

LIST OF TABLES

TABLE 1. Constructs and Instruments	54
TABLE 2. Sample Characteristics	71
TABLE 3. Reliability and Validity at Individual Level	73
TABLE 4. Agreement Indices, Means and Standard Deviations at Team Level	83

ABSTRACT

The purpose of this study was to test a hypothesized collaboration model composed of four components: team member, context, collaboration process, and degree of collaboration. A descriptive design using a causal modeling approach was used to test the collaboration model. The research settings were the healthcare centers and welfare centers in five provinces of Korea. The sample consisted of 40 nurse teams and 40 social worker teams. Data were collected from each team member and leaders involved in the Korean Home Visiting Services.

Psychometric properties of all measures were assessed at both individual and team levels. Psychometric properties of all but one subscale (Agreement of Disciplinary Logic) exhibited reliability and evidence of validity as team measures. First hypothesis, team member and context variables have a direct effect on the collaboration process, was rejected. However, some team member variables directly impacted the collaboration process. Second hypothesis, team member, context, and collaboration process variables have a direct effect on the degree of collaboration, was rejected. However, some team member, context, and collaboration process variables directly impacted the degree of collaboration. Based on the research findings, the hypothesized collaboration model was revised.

This study presented some implications for further research and collaboration practice. Future research needs to determine the reciprocal influence of each construct variable, explore the roles of each leadership style, and identify intervening or extraneous variables affecting collaboration. For the collaboration practice, this research can help

healthcare providers develop realistic and effective strategies to enhance their collaboration, which would lead them to not only assess the elderly holistically, but to also effectively plan and provide comprehensive care services to solve complex health problems of the elderly. Thus, the elderly can maintain and improve their health and well-being.

There were some study limitations related to the methodology and study findings. Sample size and a convenient sampling and a lack of random selection and diversity of the sample prevented generalization of study findings. A small number of context variables may have been insufficient to investigate the impact of context on collaboration, and potential model and variable misspecification and/or measurement errors may have occurred.

CHAPTER 1: BACKGROUND AND SIGNIFICANCE

The purpose of this study was to test a hypothesized causal model of collaboration. This chapter presents an overview of the importance of collaboration among healthcare and social welfare providers for the elderly in Korean community settings and provides a definition of collaboration. Additionally, various theoretical frameworks for examining collaboration between discipline teams in community settings are described and the significance, purpose and specific aims of this research are presented.

Importance of Collaboration for Elders in Community Settings

Half a century ago, the great majority of the global population died before the age of 50. Today, most people survive well beyond that age. Average life expectancy globally reached 65 years in 1996. In many countries, it is now well over 70 years, and is, in a few other countries, approaching 80 years; thus, the elderly population who is defined as those over age 65 has been growing rapidly (WHO, 1997). Currently, those over age 65 in the U.S. represent nearly 13% of the overall population, and one in five will be over 65 by 2050 (Satariano, 2006; United States Department of Health and Human Services, 2001). Similarly, the elderly population in Korea reached about 11% of the total population in 2003, and is expected to be one quarter or more of the total population by 2025 (Korea Statistical Office, 2003). As the population of elderly in society has increased, interest in the health and well-being of the elderly has been also increasing (Ebersole, Hess, & Luggen, 2004; Eliopoulos, 2001; Satariano, 2006).

Generally, aging, a normal part of human development, is accompanied by physical, economic, and psychological changes (Hodges, Keeley, & Grier, 2001). First, the elderly may be susceptible to health problems and suffer persistent and recurring chronic illnesses such as arthritis, hypertension, heart disease, diabetes, stroke, and dementia (H. Choi, 1996; Ebersole et al., 2004; HwangBo & Kim, 2003; P. Lee, S. Kim, S. Kim, S. Lee, E. Park et al., 2002; Roh, 2000). Many researchers have estimated that 80% of those over 65 suffer from at least one chronic illness (Harkins, Kwentus, & Price, 1984; Kane & Ouslander, 1989; Osborn, Simmons Tropea, & Schwenger, 1986; Ross & Crook, 1998). The Korean Ministry of Health and Welfare (2003) also estimated that 87% of all Korean elderly have one or more chronic illness.

Elders' chronic conditions can affect any activity domain, from maintaining hygiene to pursuing hobbies, from running errands to sleeping, or anything associated with activities of daily living (ADLs) and instrumental activities of daily living (IADLs) (Lee et al., 2002; Verbrugge & Jette, 1994). In fact, 32% of all Korean elderly reported at least one difficulty with ADLs, and about 4% reported difficulty with all ADLs and required some assistance (Korea Institute for Health and Social Welfare, 2001). Likewise, in the U. S., 49% of all older individuals reported some activity limitations for personal care due to a chronic illness, and 27% had difficulty with home management activities (U. S. Department of Health and Human Services, 2001). Thus, many elderly need healthcare services to treat their illnesses as well as support services to assist them with their ADLs and IADLs.

The elderly are also often economically disadvantaged. Because the elderly are retired, they are on fixed incomes which may be considerably lower than were their working incomes (Putnam, 2002). According to a report from the U. S. Department of Health and Human Services (2001), 3.4 million elders were below the poverty level earning an annual income of less than \$10,000, and 90% of older Americans stated that Social Security was their major source of income, although it was intended to be a supplemental source of income during retirement years (U. S. Department of Health and Human Services, 2001). Likewise, in Korea, 16% of the elderly population was enrolled in the Korean Medical Assistance Program which was designed to assist people in the low-income bracket who receive livelihood assistance and are unable to pay for health care due to their low-income and poor economic status (Korea Statistical Office, 2003). However, healthcare costs continue to rise, fueled by advances in medical technology, consumer demands for quality care, and increasing labor costs due to worker shortages. In this current healthcare environment, the elderly have reported difficulty accessing appropriate healthcare services because they can't afford them (H. Choi, 1996; Rhee, Chung, Ham, & Lee, 2006; K. Lee, 2003).

In addition, the elderly may have psychological disadvantages. The decline in the physical health of the elderly can prevent them from participating fully or meaningfully in social relationships, isolating them from society which can cause many negative consequences such as low self-efficacy, low self-confidence and depression (Bury, 1982; Charmaz, 1983; Putnam, 2002). In particular, the elderly with chronic illnesses are more likely to be isolated from society due to their physical limitations (Aday, 1993; Chappell

& Badger, 1989; Gitterman, 1991; Kahn & Antonucci, 1981; L. E. Thomas & Chambers, 1989).

Considering all the physical, economic, and psychosocial changes the elderly experience, it is critically important to provide them comprehensive and coordinated services including healthcare and social welfare services (Ko, C, Kim, C, Lee, T. Lee, K. Kim, Ma et al., 2006; T. H. Lee, 2004; Korea Statistical Office, 2003). In Korea, social welfare services for the elderly include economic assistance through the National Basic Livelihood Security System and psychosocial support or counseling. Coordinating these social welfare services with healthcare services is essential for the health and well-being of the elderly (Korea Statistical Office, 2003).

In order to provide the elderly coordinated and comprehensive care services including healthcare and social welfare services in community settings, collaboration between healthcare and social welfare providers is important (Ko et al., 2002; Lee et al., 2006; T. H. Lee, 2004; Korea Statistical Office, 2003). Collaboration enables healthcare and social welfare providers to not only assess the elderly holistically including all physiological, psychological, and social aspects, but to also effectively plan and provide comprehensive care services to solve their complex problems (Temkin-Greener, Gross, Kunitz, & Mukamel, 2004; Weick & Roberts, 1993). Thus, collaboration between healthcare and social welfare providers has been stressed as an effective way to provide quality care services for less cost because coordinated care services have reduced redundant services (Heffler et al., 2002).

Various nations have recognized the importance of collaboration between healthcare and social welfare providers in providing comprehensive services to the elderly in community settings and have legislated to improve collaboration. For example, the United Kingdom enforced collaboration between healthcare and social welfare services in community settings for elderly care by legislating the National Health Service and Community Care Act (Powell, 2001). Similarly, Japan mandated enforced collaboration between healthcare and social welfare providers to deliver comprehensive care services to the elderly in community settings by legislating the New Gold Plan (Kim, 2000). The Korean government also initiated collaboration between nurses and social workers in the Korean Home Visiting Service (KHVS) in 1999 to provide comprehensive care services to the elderly in community settings. Considering the many efforts of governments and researchers to develop and improve collaboration between healthcare and social welfare providers, it is obvious that collaboration between healthcare and social welfare providers is critically important in providing quality comprehensive care services for less cost to the elderly in community settings.

Definition of Collaboration in the Healthcare Work Environment

The concept of collaboration is typically described as a process which stresses joint involvement in intellectual activities. Collaboration conveys the idea of sharing and implies collective action oriented toward a common goal in a spirit of harmony and trust. Based on Walker and Avant's (1995) eight steps of concept analysis, collaboration can be identified from three points of view (Walker & Avant, 1995). The first view defines collaboration as *working together* with power sharing (Arcangelo, 1994; Baggs & Ryan,

1990; Dechairo-Marino, Jordan-Marsh, Traiger, & Saulo, 2001). Dechairo-Marino and colleagues (2001) defined collaboration in a study to examine nurse and physician collaboration as nurses and physicians cooperatively working together, sharing responsibility for solving problems and making decisions to formulate and carry out plans for patient care. Therefore, relating this definition to healthcare work environments, collaboration can be defined as healthcare providers' working together to improve clients' health.

Another view defines collaboration as *a process* in which participating members contribute to a common product or goal with mutual respect for differences in opinion and perspective (Henneman, Lee, & Cohen, 1995; Henry, Schmitz, Reif, & Rudie, 1992; Hills et al., 1994). The process is characterized by negotiation and compromise which are integral to making decisions. From this point of view, Coluccio and Maguire (1983) stated that collaboration is a joint communicating and negotiating decision-making process with the expressed goal of satisfying the patient's wellness and needs while respecting the unique qualities and abilities of each professional. Applying this view to healthcare work environments, collaboration can be defined as a communicating and negotiating decision-making process in which healthcare providers contribute to improving clients' health based on mutual respect and trust.

The last view on collaboration focuses on the *relationship* between two or more groups. From this perspective, collaboration is defined as a bond, union, or partnership characterized by mutual goals and commitments as well as a relationship of interdependence that recognizes complementary roles. Henneman, Lee, and Cohen

(1995) and Munding (1994) defined collaboration as a partnership that shares authority and power for practice based on knowledge and expertise, rather than role or title. This perspective implies that the relationship between nurses and physicians is not adversarial. Rather, the relationship between nurses and physicians is one in which nurses and physicians interact as colleagues. Therefore, collaboration can be defined as a partnership that shares authority and power for practices related to clients' healthcare based on knowledge and expertise.

As illustrated above, the definition of collaboration in healthcare work environments varies. However, most definitions indicate that collaboration involves working together, non-hierarchical partnerships or relationships, equality, and power sharing for a common goal (Cerne, 1993; Knudtsen, 1994; Mills, 1990).

Collaboration, thus, requires individual healthcare professionals to view themselves as members of a team and to participate in planning and decision-making with cooperative endeavors for each client's health. Also, collaborative practice requires all healthcare professionals to offer their expertise and share in the responsibility for improving the client's health based on competency or expertise rather than authority or titles.

(Arcangelo, 1994; Baggs & Ryan, 1990; Coluccio & Maguire, 1983; Evans, 1994; Henneman et al., 1995; King, 1990; Mills, 1990; Munding, 1994). Based on the literature reviews, the definition of collaboration in the healthcare setting, therefore, was defined in this research as interactions among healthcare professionals that enable the knowledge and skills of all professionals to synergistically influence clients by sharing their power.

Theoretical Framework for Collaboration

Collaboration in community healthcare settings has often been examined using organizational or sociological theories (D'Amour, Goulet, Pineault, Labadie, & Remondin, 2004; D'Amour, Sicotte, & Levy, 1999; Hayward, DeMarco, & Lynch, 2000; Sicotte, D'Amour, & Moreault, 2002; West, Borril, & Unsworth, 1998). Using organizational theory, researchers have developed several theoretical frameworks for examining collaboration among healthcare providers in community settings, such as the Model of Team Effectiveness and the Analytical Framework of Collaboration (AFIC). These models included a perspective based on the systems approach, where collaboration consists of inputs, processes, and outputs (Sicotte et al., 2002; West et al., 1998). In these frameworks, inputs were generally defined as context variables that describe the environment such as organizational characteristics and managerial supervisory control. Process included factors in direct relationship with service delivery such as an open communication process, conflict resolution, and managing social status differences. Outputs varied according to the nature of interest in a given context and referred to group performance as a final result of collaboration (Hackman & Walton, 1986; Sicotte et al., 2002; Yeatts & Hyten, 1998).

Theoretical frameworks based on an input-process-output model have been used to explain linear relationships among input, process, and output variables for collaboration. For example, West and colleagues (1998) reviewed the literature on group effectiveness and proposed the Model of Team Effectiveness for collaboration based on an input-process-output model. The model took into account the influence of inputs such

as task, group composition, cultural context and organizational context on process variables such as leadership, communication, and decision-making. Additionally, the model explained the influence of the process variables that were affected by inputs on outputs including performance and innovation of team work (Howard et al., 2003; West et al., 1998).

Based on an input-process-output model, Sicotte and his colleagues (2002) also developed the Analytical Framework of Collaboration (AFIC) to examine collaboration in community-based programs. The framework was used in Quebec community centers in Canada to identify significant context variables and collaborative process variables affecting collaboration. Like the Model of Team Effectiveness, this framework also explained the linear relationships of input, process, and output variables of collaboration. Using the AFIC, Sicotte and his colleagues (2002) reported that context variables, including program managers' characteristics and program characteristics, significantly affected collaboration processes. These processes, in turn, affected the degree of collaboration in community-based programs.

Some researchers have developed several theoretical frameworks for collaboration in community settings based on organizational sociology, such as the Structuring Model of Interprofessional Collaboration (SMIPC) and the Structuring Model of Interorganizational Collaboration (SMIOC). These models give greater emphasis to processes such as negotiation or social exchange in which professionals negotiate their positions on the team using their power as a negotiating tool (D'Amour et al., 2004; Hayward et al., 2000).

An example of this model is the Structuring Model of Interprofessional Collaboration (SMIPC) developed by D'Amour, Sicotte and Levy (1999) which focuses more on the collaboration process and how collaboration is formed among different professionals rather than the influence of context variables (inputs) on the process and outputs of collaborative team work (D'Amour et al., 2004; D'Amour et al., 1999). In the SMIPC, the process of collaboration was conceptualized into four components: sharing goals and vision, having a sense of belonging, structuring rules or regulations, and governing using a central or local leadership style. The process of developing collaboration is determined by the interactions of the four components in this model (D'Amour et al., 2004; D'Amour et al., 1999).

The Structuring Model of Interorganizational Collaboration (SMIOC) is also based on organizational sociology. It has been used to analyze collaboration between professionals from different organizations and to examine the degree and determinants of collaboration among different types of organizations (D'Amour et al., 2004). The difference between the SMIOC and the SIMPC is that the SMIOC not only emphasizes the process of collaboration including the four components of the SMIPC but also recognizes the linear relationship of input-process-output. Thus, the SMOIC incorporates the four components of the SMIPC in an input-process-output model. Using the SMIOC, the degree of collaboration among different organizations was diagnosed as collaboration in action, collaboration in construction, and collaboration in inertia (D'Amour et al., 2004).

Overall, theoretical frameworks using organizational theory or organizational sociology are mostly based on an inputs-processes-outputs model. Such models take into account the structural, process, and outputs dimensions of collaboration and emphasize the linear relationships among them. Inputs are the organizational, professional and structural factors which affect process. The process affected by inputs influences outputs such as the team's efficiency or performance (D'Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005). However, collaboration models derived from organizational theory or organizational sociology have significant limitations. They are mainly based on a linear triad of input-process-output which does not consider the dynamic and direct interactions between the input and output variables of collaboration (D'Amour et al., 2004; Sicotte et al., 2002; West et al., 1998). Thus, it is difficult to identify the direct interaction and relationships between some personal and environmental factors (input) and the degree of collaboration (output). In addition, studies using these models did not consider a multilevel approach in terms of measurement and analyses although collaboration is a complex phenomenon which has dynamic, transformative and pervasive characteristics across multilevel. Thus, the studies' findings may not be generalizable. Considering these limitations of the collaboration models, a collaboration model that can identify interactions between personal and environmental factors and the degree of collaboration at multilevel is needed.

Research Significance

A key assumption guiding community-based delivery of health and welfare services has been the need to integrate these services, typically through collaboration

among service providers (Provan, Milward, & Isett, 2002). This is especially true in organizations where working together to integrate these services has been emphasized in order to provide comprehensive care to the elderly in community settings. Such services include physical health care, income assistance, rehabilitation, psychosocial support, housing, counseling, and more. The belief has been that the elderly benefit from the integration of services because the services are comprehensive while providers are able to use their limited resources more efficiently (Alter & Hage, 1993; Provan & Milward, 2001). Much literature has reported various significant factors affecting collaboration among service providers (D'Amour et al., 2005; San Martin-Rodriguez, Beaulieu, D'Amour, & Ferrada-Videla, 2005). However, there is a paucity of conceptual models to identify how those factors directly or indirectly influence the collaboration process and the degree of collaboration.

A theoretical model for collaboration is essential to identify the determinants, process and degree of collaboration as well as to examine the interactions among the determinants, process and degree of collaboration. A model of collaboration could assist healthcare providers to work more collaboratively. For example, if team members feel that they are not collaborating as effectively as they would like, they could refer to the model's concepts of collaboration and compare them to their collaboration to determine how to strengthen or change some factors affecting their collaboration (Bronstein, 2003). Thus, a theoretical model for collaboration provides a map of appropriate ways to improve and strengthen collaboration. However, there is a paucity of appropriate theoretical models for collaboration; this has prevented many healthcare providers from

determining theoretically what factors are important and how the factors affect their collaboration and finding adequate ways to improve and strengthen their collaboration. Although there are a few collaboration models derived from organizational theory or organizational sociology, all have limitations in identifying the direct interaction and relationships between environmental factors (input) and the degree of collaboration (output) because of their linear triad structure of input-process-output which does not consider the dynamic and direct interactions between the input and output variables of collaboration. Due to the inability of these models to reflect collaboration's dynamic, transformative and pervasive characteristics, they may not be adequate for real collaborative practice settings.

In this research, a hypothesized collaboration model was proposed to identify determinants of collaboration and how those determinants interact with the collaboration process and the degree of collaboration in community settings. The hypothesized collaboration model was built on the assumption of dynamic, direct or indirect interactions among all determinants including personal and environmental factors, the collaboration process, and the degree of collaboration. This model was designed to create a deeper and more comprehensive understanding of collaboration, which may, in turn, facilitate significant operational changes to improve delivery of care services in community settings.

This research was designed to test the proposed model in a community-based program, the Koran Home Visiting Service (KHVS), to validate the model's effectiveness. The KHVS uses collaboration between nurse teams and social worker

teams to provide comprehensive care services for the elderly in community settings; thus the proposed collaboration model was tested appropriately in that program. In addition, findings from this research can give healthcare providers and administrators involved in collaborative programs realistic information and direction using a theoretical perspective for designing collaborative programs.

Purpose and Aims

The purpose of this study was to test a hypothesized causal model of collaboration. The specific aims were twofold: 1) to identify how personal and context factors affect the collaboration process; and 2) to identify how personal, context, and collaboration process factors affect the degree of collaboration.

Research questions included:

Q 1: What is the impact of team member's characteristics and context variables on the collaboration process?

H1: Team member's characteristics and context variables have a significant direct effect on the collaboration process.

Q 2: What is the impact of team member's characteristics, context variables, and collaboration process variables on the degree of collaboration?

H2: Team member's characteristics, context variables, and collaboration process variables have a significant direct effect on the degree of collaboration.

All variables for team member, context, collaboration process and degree of collaboration (outcomes) in the hypothesized model will be discussed in chapter 2 and measurement of the variables will be described in the chapter 3.

Summary

There is increasing interest in collaboration among healthcare systems. In particular, collaboration has been emphasized as a critical cornerstone in community-based programs. There is an abundance of literature discussing the various significant factors that affect collaboration. However, there is a paucity of conceptual models to identify how those factors directly or indirectly influence the process and degree of collaboration. In this research, a hypothesized collaboration model, based on a review of the literature, was proposed to explain how significant variables, personal and context, affect the process and degree of collaboration. In order to examine the model's effectiveness and validity, the model was tested in a community-based program, the Korean Home Visiting Service.

CHAPTER 2: CONCEPTUAL FRAMEWORK

This chapter describes the System Research Organizing (SRO) Model which grounds the collaboration model used in this study. Also, the collaboration model which was derived from the SRO Model is delineated by defining four core components: team member (client), context, process, and outcomes. Research variables regarding each component in the model are also presented.

System Research Organizing (SRO) Model

The SRO model was designed as an organizing model for system level research to improve health outcomes by identifying significant factors that affect outcomes as well as interactions among the factors and outcomes. It has four major concepts: client, context, intervention, and outcomes (Brewer et al., 2002; Verran, 2003). The SRO model is a dynamic model grounded in Donabedian's linear triad of structure-process-outcome and specifically recognizes the influence of context and client characteristics on the intervention-outcomes relationship (Donabedian, 1966; Doyle & McEwen, 2002). In addition, the SRO model is derived from the Quality Health Outcomes (QHO) model which has a basic structure of client, system, intervention, and outcomes and a fundamental assumption acknowledging interaction among model components (Brewer et al., 2002; Mitchell, Ferketich, & Jennings, 1998).

Although the SRO model is based on Donabedian's linear model and the QHO model, the SRO model includes attributes those models did not have. Inherent in the SRO model is a focus on the whole (system), the parts that make up that whole, and the interactions among the parts; this focus sets it apart from many other models used to

guide nursing outcomes and organizational research. For example, the QHO model views system as a component in the model rather than a whole, and Donabedian's linear model of traditional structure-process-outcome does not consider the dynamic and direct interactions between structure variables and output variables (Aiken, Sochalski, & Lake, 1997; Brewer et al., 2002; Mark, Saylor, & Smith, 1996; Mitchell et al., 1998; Parsons, 1999). However, the SRO model views system as a whole and acknowledges the direct reciprocal interactions among all components including interaction between structure variables and outcome variables.

Among the SRO model's four interacting concepts of client, context, intervention, and outcomes, the first core concept is client whose characteristics interact with context, intervention, and outcomes in a reciprocal manner (Brewer et al., 2002; Doyle & Effken, 2002; Verran, 2003). In the SRO model, client is broadly defined as a system input that drives interventions. Client varies depending on what researchers intend to investigate and how all of the model's concepts are defined based on a particular study's purpose (Brewer et al., 2002; Verran, 2003). Thus, based on a researcher's intent, various system inputs such as patients, healthcare providers, communities, or organizations are defined as client (Brewer et al., 2002). For example, Robichaud (2004) defined a long term care facility as client in her study which investigated the fiscal losses on supplies in the facility. In studies to examine the effectiveness of a computational modeling program, Effken and her colleagues (2003) and Effken and her colleagues (2005) described patients as client and included patients' characteristics such as age, ethnicity, and comorbidities in client constructs.

The second core concept is context. In the SRO model, context is defined as the environment or background of the system of interest (Brewer et al., 2002; Robichaud, 2004; Verran, 2003). Like client, context may also directly or indirectly influence all the other model constructs (Brewer et al., 2002; Doyle & Effken, 2002). In particular, context has been stressed as a strong component and a major concept in many organizational system theories such as the Structural Contingency Theory and the Technology Theory because context or environments significantly influence outcomes such as the effectiveness or productivity of systems or organizations (Bertalanffy, 1968; Jaffe, 2001; Lawrence & Lorsch, 1967). Therefore, it is critically important to understand the context in system studies (Brewer et al., 2002; Verran, 2003).

Context in the nursing literature is often equated with settings such as acute care, long-term care, and transitional care. However, the SRO Model includes not only the settings but also the influence of social, cultural, historical, political, and economic factors on the context (Brewer et al., 2002). For example, Doyle and Effken (2002), Effken and her colleagues (2003), and Effken and her colleagues (2005) included unit and organizational (hospital) culture in the context (Doyle & Effken, 2002; Effken et al., 2005; Effken et al., 2003). Similarly, McEwen and Lamb (2002) defined proximity to healthcare delivery system, organizational culture, and immigration policy as context (McEwen & Lamb, 2002). Thus, the SRO model extends context to include the sociopolitical environments in which persons interact; this allows researchers to grasp various factors that directly and indirectly influence health (Brewer et al., 2002).

The third core concept is intervention. This is usually associated with nursing process and activities. Intervention, in the SRO Model, is defined as the action variable that is measured, changed, altered, or varied within a study or system of interest (Brewer et al., 2002). Within the SRO model, the perspective on intervention is similar to that seen in other system models. Jennings (1991) also identified intervention as actions used in particular situations to elicit desired outcomes. Similarly, the QHO model defined clinical processes and activities as direct and indirect interventions (Mitchell et al., 1998).

Designation of the intervention, like client, in the SRO model also varies according to the purpose of the research (Brewer et al., 2002). For example, Saewert (2003) identified consumer participation as intervention in her dissertation to explain and predict mental health outcomes through testing the SRO model. Robichaud (2004) identified processes of management controls over acquisition and distribution of inventory to improve tracking of inventory usage and appropriate charging of supplies to residents as intervention. However, in Effken and her colleagues' (2005) research, intervention variables were patient unit characteristics which is far different from action variables commonly observed in nursing research. Unit culture, staffing/skill mix, physical environment, and work flow (i.e. support system and delivery model) were deemed intervention since they were considered to be most likely to be altered in order to improve or change client outcomes (safety and quality).

The last concept of the SRO model is outcomes. Outcomes are considered a performance measure and may be defined as the result of interventions, actions taken, or changes that occurred within the system (Brewer et al., 2002; Robichaud, 2004). In

particular, outcomes in the SRO model are identified differently compared to the outcomes of Donabedian's linear model and those of the QHO model. Outcomes in the linear model and the QHO model are delineated as the final result of care. However, outcomes in the SRO model are not the end result of care but can continuously interact with other system variables. For example, Robichaud (2004) demonstrated in a study to investigate the fiscal losses on supplies in a community setting that the community setting's financial changes in 2004 (outcomes) affected staffing (client), context (procurement and management system of supplies), and intervention (quality improvement) in 2005. Also, Brewer and her colleagues (2002) exemplified that an outcome, shorter length of stay for a specific population, changed nurse staffing levels (intervention) by decreasing the number of nurses in clinical units.

Through the literature reviews on the SRO model, it is evident that all four components in the SRO model influence each other directly or indirectly. The arrows among model components, depicted in studies using the SRO model, address interaction, interdependence, feedback, and complexity among the components. In particular, the studies of Effken and her colleagues (2003) and Effken and her colleagues (2005) to examine the effectiveness of a computational modeling program clearly identified that patient characteristics (client), organizational characteristics (context), unit characteristics (intervention), and patient outcomes (outcomes) interacted with each other directly or indirectly in actual units as well as virtual units.

Since the SRO model was proposed by the Nursing Systems Core at the University of Arizona, it has been largely adapted by faculty and students involved in the

Nursing Systems Core to study organizational and clinical problems of interest to nursing (Brewer, 2002). The SRO model has been used in nursing within hospital settings and community settings. The SRO model has been mainly adapted in hospitals, especially in nursing administration (informatics). Effken and her colleagues (2003) and Effken and her colleagues (2005) used the SRO model in nursing administration to examine a computational modeling program, OrgAhead, to transform organizational research data into actionable information. Also, Doyle and Effken (2002) adapted the SRO model to evaluate the efficacy of the use of bar-coding to reduce medication error rates. From these studies, the SRO model has been evaluated as a useful conceptual framework to examine the effectiveness of programs or interventions in nursing practice.

As a conceptual framework, the SRO model has also been adapted in community settings without any modification, with some modification, or in conjunction with other models. Some researchers have expected that the SRO model theoretically would guide community-based research to examine important personal (client) and environmental (context) variables that affect outcomes of community-based programs. For example, McEwen and Lamb (2002) showed that the SRO model could be used to investigate relationships among some factors (client, context, and intervention variables) and completion of preventive therapy for Mycobacterium Tuberculosis (outcomes).

Overall, the SRO model has been adapted in various settings as a useful conceptual framework. Some researchers have used the model without any modification. In contrast, some have modified the model to develop effective frameworks for their research, but they supported the SRO model's basic structure and assumptions. The SRO

model has been mainly used to examine client, context and intervention factors that affect outcomes and interactions among those factors and outcomes. In particular, community-based research using the model has focused on exploring context variables that affect outcomes. Even though the SRO model is in an early validation stage for generalizability, it can be a valid conceptual framework for nursing system research since the use of the model in most studies has proved effective in various settings.

Hypothesized Collaboration Model and Variables

In order to identify significant factors affecting collaboration and to explore relationships between the factors and collaboration, the collaboration model proposed in this study was derived from the SRO model. It consists of four components: team member, context, collaboration process, and degree of collaboration (outcomes). Figure 1 presents the research conceptual model, Collaboration Model, in which the four concepts were identified and relationships among the concepts were hypothesized.

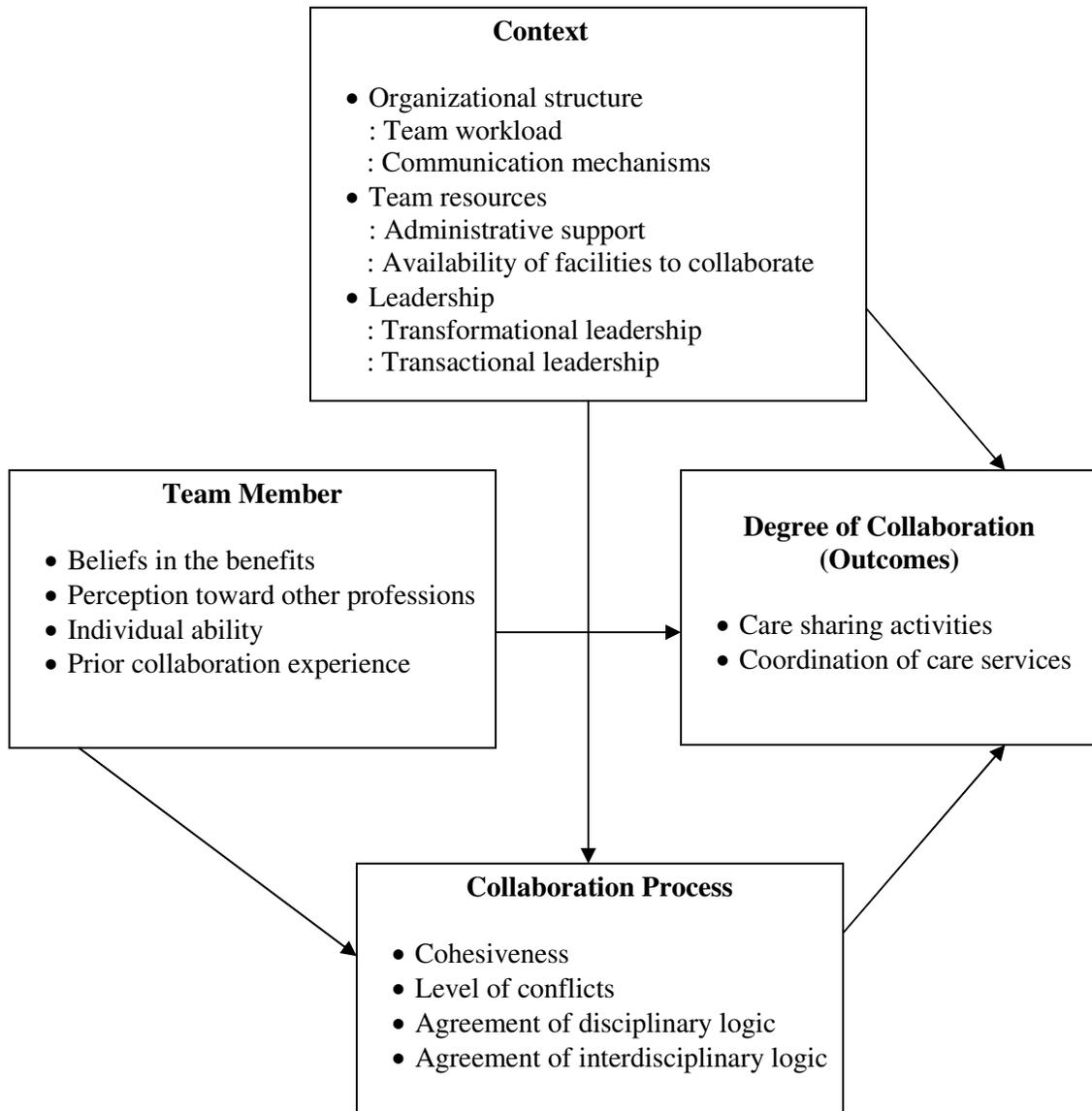


FIGURE 1. Hypothesized Collaboration Model

Team Member

Team member in the collaboration model was constructed of the characteristics of the members of nurse teams and social worker teams. The literature indicates that team member's characteristics such as personal beliefs in the benefits associated with collaboration, perception toward other professions, individual ability relevant to collaboration, and prior experiences in collaborative work are significant personal factors related to collaboration (Golin & Ducanis, 1981; Rhee, Chung, Ham, & Lee, 2006; Ryu & Hwang, 2004; Temkin-Greener et al., 2004; Yoo, 2003). For example, an individual's strong beliefs in the benefits of collaboration have positively affected collaboration in many studies (Cohen & Bailey, 1997; Jeung, 2002; Klimoski & Mohammed, 1994; Sicotte et al., 2002; Weick & Roberts, 1993). In Sicotte and his colleagues' (2002) research, the degree of collaboration among healthcare providers in community-based service programs appeared to be higher in persons who had higher beliefs in the benefits of collaboration.

However, a poor perception toward other professions negatively affected interdisciplinary collaborative activities. Golin and Ducanis (1981) reported in their research that often each member was not aware of the roles or specific competencies of other professionals so they did not consider collaborating with them; this seriously interfered with the development, process, and degree of collaboration. Indeed, Lee and her colleagues (2006) found that collaboration between nurses and social workers in a community-based program was low in those who had poor perception toward other professions. In contrast, positive attitudes and perception toward collaborators supported

collaboration in healthcare teams in Brown's (1995) study to identify factors facilitating or inhibiting collaboration within a professional bureaucracy.

Individual ability such as expertise, skills or competencies has also been identified as a significant factor of collaboration. Each individual's abilities created trust among team members which is essential to collaboration, which, in turn, motivated all team members to work together to share responsibility (Evans, 1994; Gage, 1998; Henneman et al., 1995; Pike et al., 1993; Stichler, 1995; Warren, Houston, & Luquire, 1998). Yoo (2003) and Ryu and her colleagues (2004) found, in their studies to explore barriers to collaboration between nurses and social workers, that lack of individual ability to provide special services requested by other professional teams and to link to resources of other professional teams was an insurmountable barrier to collaboration.

Some researchers estimated that each professional's prior experience with collaboration was a significant factor relevant to collaboration. They explained that when an individual's prior experiences with collaboration were few and negative, she/he was reluctant to collaborate with other professionals (Henneman et al., 1995; Kraus, 1980; Temkin-Greener et al., 2004). In contrast, an individual's positive experiences with collaboration was shown to be linked with current levels of successful collaboration (Bronstein, 2002). Also, Temkin-Greener and his colleagues (2004) found that the more years of collaboration experience, the more likely the collaboration was considered to be effective.

Based on the above literature review on the influence of individual characteristics on collaboration, team member in the proposed collaboration model was composed of

characteristics of nurses and social workers involved in the KHVS. Personal beliefs in the benefits associated with collaboration, perception toward other professions, individual abilities relevant to collaboration, and prior experiences of nurses and social workers in collaborative work were team member constructs in the collaboration model.

Context

In the proposed collaboration model, context, as an explanatory variable, was defined as environmental attributes that affect the collaboration process and the degree of collaboration. The nature of the organization defines the team, its members, its tasks, and the place and time of its interactions (Golin & Ducanis, 1981). Thus, how the team operates is strongly influenced by its organizational setting's characteristics such as organizational structure, team resources, and leadership (Golin & Ducanis, 1981; San Martin-Rodriguez et al., 2005). Sullivan (1998) also described a supportive organization's structure, human and material resources, and supportive leadership for collaboration as prerequisites of successful collaboration. Thus, context in the collaboration model included organization structure, team resources, and leadership relevant to collaboration.

Many studies have identified that organizational structure such as team workload and formalized communication mechanisms affect collaboration (Bronstein, 2003; Ryu & Hwang, 2004; Sicotte et al., 2002; Yoo, 2003). Organizational structure includes ways that an organization and supervisor allocate resources and assign work that either supports or inhibits collaboration (Bronstein, 2003). Effective collaboration demands that sufficient time be available for each professional to share information and develop

interpersonal relationships (Mariano, 1989; Warren et al., 1998). Thus, teams with a heavy workload may be reluctant to invest their limited time in collaborating with other teams (Brown, 1995; Hord, 1986; Yoo, 2003). In Yoo (2003)'s research, nurses and social workers collaborating in community settings reported that a heavy workload was a barrier to their collaboration. In addition, Hord (1986) reviewed the experience of a wide spectrum of collaborators in human services, education, academia, and management and identified that insufficient time for negotiation and exchange due to a heavy workload was a structural barrier to collaborative activity. Similarly, Brown (1995), in his dissertation to identify factors facilitating or inhibiting collaboration within a professional bureaucracy, identified insufficient time and excessive workload as structural barriers to collaboration in healthcare settings.

Another aspect of organizational structure that influences collaboration is a formalized communication mechanism because it allows each person to communicate more directly and efficiently (Golin & Ducanis, 1981; Kagan, Goffin, Golub, & Pritchard, 1995; San Martin-Rodriguez et al., 2005; Sicotte et al., 2002; Solar & Shauffer, 1993). Much research has stressed that formalized communication mechanisms such as regularly scheduled meetings and formal, written, patient referral and follow-up forms enhanced collaboration among service providers in healthcare settings (Henneman et al., 1995; Kraus, 1980; San Martin-Rodriguez et al., 2005). Through an effective communication mechanism, a program's planning, goal-setting, and evaluation process are articulated to all service providers; this results in providers effectively collaborating with each other to achieve common goals (Henneman et al., 1995; Sullivan, 1998).

Many studies have revealed the importance of a formalized communication mechanism for collaboration. In Temkin-Greener and colleagues' (2004) research, communication was identified as the most significant factor to predict the effectiveness of collaboration. Also, Mattessich and Monsey (1992) and Abramson and Mizrahi (1996) revealed that effective communication among collaborators enhanced collaboration (Abramson & Mizrahi, 1996; Mattessich & Monsey, 1992). This parallels Kagan and colleagues' (1995) study to examine service integration in five states. They found that communication significantly influenced collaboration success (Kagan et al., 1995). On the other hand, Roh (2000) and Seo (2002) identified that the absence of a formalized referral mechanism was the greatest barrier to collaboration between nurse teams and social worker teams in community-based Korean home visiting services.

Another context variable in the collaboration model was team resources. Team resources including administrative support and availability of appropriate facilities to collaborate have been identified as key factors for collaborative practices (Henneman et al., 1995; Ryu & Hwang, 2004; San Martin-Rodriguez et al., 2005; Yoo, 2003). Administrative support is considered a particularly critical factor to implement collaboration. Brown (1995) found that lack of administrative support was a barrier to collaboration in his research to identify factors facilitating or inhibiting collaboration within a professional bureaucracy. Indeed, one of the most important administrative supports is financial investment. Hord (1986), in his research to study the experience of a wide spectrum of collaborators in human services, education, academia, and management, identified financial commitment as a factor necessary to sustain

collaboration. Mattessich and Monsey (1992) also reported that collaboration was successful when an adequate financial base existed. Another administrative support is sufficient manpower. Many studies have reported sufficient manpower as a key determinant of collaboration (Ryu & Hwang, 2004; San Martin-Rodriguez et al., 2005; Yoo, 2003). Ryu and Hwang (2004) found that manpower shortage was the biggest problem inhibiting professional collaboration in providing comprehensive healthcare services to the elderly in community settings.

As important as administrative support, the availability of appropriate facilities with whom to collaborate has also been reported in several studies. In Yoo's (2003) research, nurses and social workers in community settings reported a lack of appropriate healthcare facilities and welfare institutions with whom to collaborate as a significant barrier to their collaboration. Likewise, Kim (2000) found, in her thesis on an activation plan for Home Visiting Nursing Services, that visiting nurses reported difficulty in finding an appropriate welfare institution with whom to collaborate in community settings.

The last context variable was a team leader's leadership. Leadership has been emphasized as a factor that influences people to accomplish goals (Huber et al., 2000). According to Temkin-Greener and colleagues (2004), leadership includes setting goals and standards, responding to changes, and supporting staff. Similarly, Mukamel and colleagues (2006) defined leadership as setting the goals and standards for the team and stated that leadership facilitated or inhibited team processes (Mukamel et al., 2006).

Much research examining collaboration in healthcare settings has found that the leadership provided by team leaders influenced the development and process of collaboration. Studies by D'Amour and his colleagues (1999) and Prescott and Bowen (1985) revealed the importance of a team leader's leadership in the development and process of collaboration in hospital settings. In particular, some researchers pointed out that developing collaboration with other professionals was facilitated by having leaders who motivated team members to engage in collaborative practice and who were able to create an organizational setting that fostered collaboration (Evans, 1994; Henneman et al., 1995; Johnson, 1992; Stichler, 1995).

There are two types of leadership: transactional and transformational leadership (Bass, 1985; Burns, 1978). Transactional leadership is characterized by leaders exchanging promises of rewards to subordinates for their contributions toward goal achievement. This type of leadership focuses on achieving standard performance and often is found in organizations with rigid hierarchical structures (Bass, 1985).

Transformational leadership is an extension of transactional leadership and is defined as a dynamic interaction with team members to achieve greater organizational or program outcomes (Tourangeau & McGilton, 2004). Burn (1978) postulated that transformational leaders facilitated major organizational change and higher levels of organizational performance because of the transformation in attitudes, values, and behaviors that resulted from interactions between leaders and followers. In addition, a transformational leader identified and communicated a vision and organizational values, then asked followers to commit to these values as they worked together toward achieving

that vision. Thus, this type of leadership improved organizational outcomes. Indeed, many studies have reported that transformational leadership has been associated with positive organizational outcomes and may contribute indirectly to the quality of nursing care (J. Choi, 2003; Park, 1997; Shim, 2005; Stordeur, Vandenberghe, & D'hoore, 2000). Based on the above literature reviews on the influence of context variables on collaboration, organizational structure, team resources, and leader's leadership style were included as context variables in the collaboration model.

Collaboration Process

Unlike client and context, the concept of intervention in the SRO model was modified to reflect process in the proposed collaboration model. Since intervention was defined not only as an action variable that varies within a system of interest in the SRO model but also as processes and activities in the QHO model, collaboration process was substituted for intervention in the collaboration model. Collaboration process in this study was defined as actions that take place between collaborators to elicit desired outcomes.

Much research has been devoted to understanding the collaborative process, defining the components of effective collaboration and identifying the characteristics of effective teams. In these studies, effective collaboration has been characterized by high cohesiveness and a low level of conflicts among different professionals, and specific attitudes associated with traditional disciplinary logic and interdisciplinary logic (Jehn, 1995; Jeung, 2002; Ko et al., 2002; Kwon, 2002; Sicotte et al., 2002; Temkin-Greener et al., 2004).

Cohesiveness or social integration among different professionals has been most often reported as an underlying component of effective collaboration (Fried, Topping, & Rundall, 2000; Golin & Ducanis, 1981; Heinemann & M., 2002; Nichols, DeFries, & Malone, 2002; Sicotte et al., 2002; Temkin-Greener et al., 2004). In the Temkin-Greener and his colleagues' study (2004), cohesiveness appeared to influence interdisciplinary team effectiveness. Sicotte and his colleagues (2002) also found cohesiveness among different professionals was positively associated with collaboration.

Conflicts with different professionals in interdisciplinary collaborative services frequently implies task conflicts or disagreements regarding task content (Jehn, 1995). In one study, Korean nurses experienced task conflicts with social workers in a community-based home visiting service and were reluctant to collaborate with social workers (Ko et al., 2002). This finding was similar to Sicotte and his colleagues' (2002) research in which a high level of task conflicts among healthcare professionals was negatively associated with the degree of collaboration in community settings. On the other hand, Temkin-Greener and colleagues (2004) found that conflict management positively impacted interdisciplinary team effectiveness in their research designed to measure interdisciplinary team performance in a long-term care setting.

Other characteristics required for effective collaboration are specific attitudes associated with traditional disciplinary logic and interdisciplinary logic. These attitudes have been strongly linked in many studies to the collaborative process in delivering care (Bozzini, 1988; Brunet & Vinet, 1978; Couture, 1978; D'Amour, 1997). Particularly, healthcare tasks and responsibilities are no longer performed solely by a medical

practitioner but by a complex, diversified system of professionals; thus the traditional disciplinary logic that stresses independent activities and decision-making has been considered a negative attitude for collaboration. Generally, disciplinary logic emphasizes the territory of a single professional and disregards the roles and territories of other professionals although their territories may overlap. Thus, it inhibits collaboration among different professionals (Abbott, 1988; Bozzini, 1988; D'Amour et al., 1999; Reese & Sontag, 2001).

Indeed, several studies identifying the difficulty of implementing interdisciplinary care in community settings have found that traditional disciplinary logic negatively affected collaboration and that successful team work was hampered by allegiances that leaned too strongly toward a workers' profession or department (Abramson & Mizrahi, 1996; D'Amour et al., 2004; D'Amour et al., 1999; Sicotte et al., 2002). Jeung (2002) and Kwon (2002) also found that nurses and social workers who insisted on their own discipline's profit and territory in a community-based care service program were not able to collaborate successfully (Jeung, 2002; Kwon, 2002).

In contrast, interdisciplinary logic emphasizing sharing of care activities and decision-making power has been reported in many studies to be a positive attitude for collaboration (Abbott, 1988; Bozzini, 1988; D'Amour et al., 1999; Reese & Sontag, 2001). Sicotte and his colleagues (2002) found, in their research to identify collaboration in community-based service programs, that interdisciplinary logic that recognized the competence and expertise of other professionals positively affected collaboration for providing high quality services. Therefore, successful collaboration process has been

characterized by low agreement with traditional disciplinary logic and high agreement with interdisciplinary logic. Considering the impact of the four collaboration process variables (cohesiveness, level of conflicts, agreement of disciplinary logic, and agreement of interdisciplinary logic) on collaboration, the collaboration process in the proposed collaboration model contained all four variables.

Degree of Collaboration

Outcomes are a measure of collaboration and refer to the degree of collaboration achieved by collaborators as a result of the collaboration process. The degree of collaboration has been measured with various collaborative work performances. For example, care sharing activity among different professionals has been used to measure the results of the collaboration process in many studies. Collaboration goes beyond care activities that professionals are usually trained to do within their own fields, so it requires different professionals on a team to share care activities by sharing information and decision-making power based on their knowledge and expertise (Evans, 1994; Miccolo & Spanier, 1993; Sullivan, 1998). Sullivan (1998) indicated that outcomes of the collaborative process can be measured by the degree of sharing, problem solving, and patient care activities in health care settings. Along these lines, Sicotte and his colleagues (2002) assessed the degree of collaboration by measuring the degree of care sharing activities.

Along with care sharing activities, many researchers have measured the degree of collaboration by measuring the degree of coordination of care services (Sicotte et al., 2002; Wells, Johnson, & Salyer, 1998). In the Wells and her colleagues' (1998) study on

collaboration between physicians and nurses in hospital settings, the degree of coordination of care services for adult patients was used to index the degree of collaboration. Also, Sicotte and his colleagues (2002) measured the degree of collaboration in community-based service programs by measuring the degree of the coordination of care services. Therefore, the degree of collaboration was identified by measuring the degree of sharing care activities and the degree of coordination of care services in this study.

Consistent with the proposed collaboration model, it was hypothesized that the degree of sharing care activities and coordination of care services would be affected by team member's characteristics, context variables, and collaboration process variables. Indeed, in Sicotte and his colleagues' (2002) research, sharing care activities and coordination of care services were positively associated with some team member characteristics such as beliefs in the benefits of collaboration and the collaboration process including cohesiveness and agreement of interdisciplinary logic. In contrast, sharing care activities and coordination of care services were negatively associated with some variables of the collaboration process such as level of conflicts and agreement of disciplinary logic.

Summary

As a conceptual framework, the System Research Organizing (SRO) model has been used effectively to examine client, context and intervention (process) factors that affect outcomes and interactions among the factors and outcomes. Thus, the proposed collaboration model was based on the SRO model. The model was tested in the Korean

Home Visiting Services program not only to identify significant factors affecting the collaboration process and the degree of collaboration between nurse teams and social worker teams, but also to examine interactions among the factors, the collaboration process, and the degree of collaboration.

The proposed model included four components: team member, context, collaboration process, and degree of collaboration (outcomes). Team member was constructed of team member's characteristics such as beliefs in the benefits of collaboration, perception toward other professions, individual ability, and prior collaboration experience. Context included the organizational structure, team resources, and a team leader's leadership style. Collaboration process referred to activities that took place among collaborators and included cohesiveness, level of conflicts among collaborators, agreement with disciplinary logic, and agreement with interdisciplinary logic. Degree of collaboration (outcomes) among collaborators was evaluated by measuring the degree of sharing care activities and coordination of care services.

CHAPTER 3: METHODOLOGY

This chapter details the methodology of this study, including the research design, settings, and sample criteria and selection. In addition, model variables are described, and data collection and data analysis are discussed.

Research Design

A descriptive design using a causal modeling approach was used to test a collaboration model in a community-based program, Korean Home Visiting Services (KHVS). The impact of the characteristics of team member and context variables such as organizational structure, team resources, and leadership style on the collaboration process between nurse teams and social worker teams was explored. Furthermore, how all of the characteristics of team member, context variables, and the collaboration process affected the degree of their collaboration was examined.

Research Settings

The research settings were public community healthcare and social welfare centers participating in the Korean Home Visiting Services (KHVS) in five provinces, Deagu, Pusan, Ulsan, Gyeongbuk, and Gyeongnam. There were 75 public community healthcare centers and 117 social welfare centers participating in the KHVS in the five provinces; all of these centers were research settings.

The purpose of the Korean Home Visiting Services (KHVS) was to deliver high quality comprehensive healthcare and social welfare services to the elderly in community settings. In the KHVS, healthcare services for the elderly included home visiting services, health counseling and education, health examination, healthcare management of chronic

illnesses, and consultation. These healthcare services were mainly provided by a home visiting nurse team from each public community healthcare center. In the KHVS, social welfare services for the elderly included not only assistance with ADLs and IADLs such as bathing, grooming, preparing meals, and doing laundry, but also financial support, transportation support, supply of rehabilitation equipment, health education, and exercise programs. These social welfare services were mainly provided by a home visiting social worker team from each social welfare center.

In order to provide high quality comprehensive care in community settings, the KHVS required collaboration between nurse teams and social worker teams, rather than between individual nurses and social workers. For example, when a nurse team found that an elderly person needed healthcare services as well as social welfare services the team was encouraged to collaborate with a social worker team to assess the complex needs of the elder and plan and/or deliver comprehensive care to the elder. In the same way, a social worker team was also encouraged to collaborate with a nurse team for providing comprehensive care services (Korea Statistical Office, 2003). Therefore, the interest of this study was collaboration at the team level, not at the individual level.

Research Samples

Each public healthcare center had a full-time home visiting nurse team, so all members of the 75 nurse teams in the five provinces were potential participants in this research. Similarly, a social welfare center had a full-time home visiting social worker team, so all members of the 117 social worker teams in the five provinces were potential participants. However, it would have been impractical to recruit all members of the teams

in the research. Thus, the sample size was determined by considering recommendations for establishing an appropriate sample size for statistical power in model testing. The recommendations for sample size vary from 30 subjects per independent variable to a minimum of 5:1 (Gorsuch, 1983; Nunnally & Bernstein, 1994; Pedhazur, 1997). This research used the minimum ratio of 5:1 because it was an exploratory study. Since the proposed collaboration model had sixteen independent variables (four from team member, eight from context including three communication channels, and four from process) an adequate sample size for statistical power in the collaboration model testing was eighty teams. This study recruited a sample of eighty teams including 40 nurse teams and 40 social worker teams. There were an unequal number of nurse and social work teams in the five provinces. Thus, the investigator first recruited 40 nurse teams because the number of nurse teams was smaller than that of the social worker teams. Then 40 social worker teams with whom the 40 nurse teams mainly collaborated were recruited, matching a nurse team with a social worker team. Inclusion criteria were members of the nurse and social worker teams participating in the KHVS whose team leaders had agreed to participate. In addition, the members had to have been employed for at least three months with the KHVS because new members would not have had sufficient experience working with collaborative teams to have had reliable and valid opinions about collaboration. The exclusion criterion was nurses and social workers teams who had worked for less than three months in the KHVS.

Human Subjects and Recruitment of Subjects

Research settings were public community healthcare and social welfare centers participating in the KHVS. Since healthcare centers were administered by the Korean Ministry of Health and Welfare and social welfare centers were administrated by Korean Association of Social Welfare Centers, authorization letters were obtained from chief administrators of the two institutions. The authorization letters were submitted to the University of Arizona's Human Subjects Protection Program with a project review form, a subject's disclaimer form, a flyer, and questionnaires. After IRB approval, a team leader of the KHVS in each of the 40 healthcare centers and 40 social welfare centers was contacted to explain the research in detail and to seek permission to recruit nurse or social worker team members for this research.

After obtaining permission from the team leader, the investigator attended a regular team meeting of the KHVS to introduce the research to all team members. At the beginning of the meeting, the investigator explained the purpose of the research, importance, procedures, and participant's rights using a flyer describing the study and its purpose and including the investigator's contact information (Appendix A). Also, the investigator provided potential participants with a subject disclaimer form (Appendix B) and a packet of survey instruments (Appendix C) at the meeting. If participants had questions, they were asked to contact the investigator by email or telephone. The only cost to the participants was their time; it took approximately one half hour to complete the questionnaires. A set of pens was provided to all team members at the regular team meetings as a small token of appreciation and a partial reimbursement for their time and

willingness to participate. This was not expected to create pressure or undo influence.

Completion of the questionnaires was considered to be consent to participate and all data were collected using self-report surveys.

Measures

In order to measure each of the four components, team member's characteristics, context, collaboration process and degree of collaboration (outcomes) in the collaboration model, seven instruments were used. The instruments were selected based on each instrument's ability to measure a target variable validly and its evaluation in other studies. Table 1 presents each instrument, the measurement level, and the analysis level. In addition, additional descriptive data were collected.

Team Member

Beliefs in the benefits of collaboration. Beliefs in the benefits of collaboration was measured by the Belief in the Benefits of Collaboration Scale developed by Sicotte and his colleagues (2002). This scale was designed to assess each healthcare provider's belief in the benefits of collaboration. The scale was composed of five items. Some example items are: "A better answer to a patient's bio-psycho-social needs is in interdisciplinary work", "Interdisciplinary work provides the quality of care and services offered to patients.", and "Interdisciplinary work fosters increased integration of interventions." In this research, the referent "patient" was changed to "clients" in all items. Each item was measured with a 5-point Likert type scale ranging from 1(strongly disagree) to 5(strongly agree). A higher score indicated a higher belief in the benefits of collaboration. In Sicotte and his colleagues' (2002) study, the reliability of this scale was high with a coefficient

TABLE 1. Constructs and Instruments

Construct	Variable	Instrument	Measurement Level	Analysis Level
Team Member	Beliefs in the benefit of collaboration	Beliefs in the Benefits of Collaboration Scale	Individual (staff)	Team (aggregated)
	Perception toward other professions	Interprofessional Perception Scale	Individual (staff)	Team (aggregated)
	Individual ability	Individual Ability Subscale in the Scale of Barrier Factors to Offering Health and Welfare Service	Individual (staff)	Team (aggregated)
Context	Team resources	Team Resource Subscale in the Scale of Barrier Factors to Offering Health and Welfare Service	Individual (leader)	Team
	Leadership	Multifactor Leadership Questionnaire	Individual (staff)	Team (aggregated)
Process	Collaboration process	Intragroup Process of Collaboration	Individual (staff)	Team (aggregated)
Degree (Outcomes)	Degree of collaboration	Intensity of Collaboration	Individual (staff)	Team (aggregated)

alpha of .91. Its construct validity was examined and items had a sufficient loading on a single factor through factor analysis.

The investigator translated the Belief in the Benefits of Collaboration Scale from English to Korean in a translation study. An expert panel of eleven bilingual (Korean and English) participants who had studied, worked or lived in English speaking countries examined the equivalence between the English version and the Korean translation. For each item, participants were asked to evaluate whether the two versions were equivalent (range from 1, “strongly disagree” to 6, “strongly agree”). The translation study demonstrated there was excellent equivalence between the original English version and the Korean version with an equivalence mean score of 5.46. As a result, the Belief in the Benefits of Collaboration Scale translated from English to Korean by the investigator was used in this research.

Perception toward other professions. To identify how nurse teams and social worker teams viewed each other, the Interprofessional Perception Scale (IPS), developed by Duncanis and Golin (1979), translated from English to Korean, and revised in a preliminary study by Rhee, Chung, Ham, and Lee (2006) was used. The original instrument developed by Duncanis and Golin (1979) contained two parallel forms, perception toward other professions and perception toward one’s own profession. Thus, the IPS has been used to measure each professional’s perception toward other professions as well as his/her own profession in healthcare settings. Both forms are identical in content; however, the referents were changed to reflect the subject of interest. In this

research, the IPS for other professions was used to measure nurses and social workers' perceptions of each other.

The Interprofessional Perception Scale (IPS) was composed of 15 items using a 5-point Likert type scale, with one indicating "strongly disagree" and five indicating "strongly agree". The referent "title of profession" was changed to "social workers" in the questionnaire for nurses and to "nurses" in the questionnaire for social workers. For example, items for nurses were; "Social workers are competent", "Social workers understand the capabilities of my profession, nursing", and "Social workers fully utilize the capabilities of my profession, nursing". In the positively phrased items, a high score indicated a more positive perception toward the other profession. However, the IPS included some negatively phrased items such as "Sometimes social workers encroach on my professional territory" and "Social workers are very defensive about their professional prerogatives". In the negatively phrased items, a high score indicated a more negative perception toward the other profession. Therefore, these were reverse coded.

The IPS's content validity was established by an expert group and its reliability was established through a test-retest procedure over a three-week period using the responses of 24 students in a graduate rehabilitation counseling program. Overall, the reliability through test-retest was high, demonstrating 77.7% agreement between before and post responses. Rhee and colleagues (2006) used the IPS in a study to identify the associations of collaboration between nurses and social workers with their perceptions of each other. In their research, the IPS exhibited high reliability, with a Cronbach's alpha over .81.

Individual ability. Individual ability was measured with the Individual Ability Subscale from the Scale of Barrier Factors to Offering Health and Welfare Service developed by Yoo (2003). The Individual Ability Subscale was composed of two self-reported items. The two items for the nurses are “I evaluate my own ability to provide special services requested by social worker teams as excellent.” and “I evaluate my own ability to link to resources of social worker teams as excellent.” In the questions for the social workers, the referent was changed to nurse teams. Each item was measured using a 5-point Likert type scale, with one indicating “strongly disagree” and five indicating “strongly agree”. A higher score indicated higher individual ability. In Yoo’s (2003) study, reliability of the Scale of Barrier Factors to Offering Health and Welfare Service was high with a Cronbach’s alpha of .77, but the reliability of the Individual Ability Subscale was not examined because it was composed of only two items.

Prior collaboration experience. Prior collaboration experience has been identified as a significant factor relevant to collaboration in previous studies. For example, if an individual’s prior experience with collaboration was negative, they tended to be reluctant to collaborate with others. Thus, the investigator developed a question to measure prior collaboration experience of team members which stated: “If you have ever participated in collaboration between disciplinary teams before, how was the experience?”, using a 5-point Likert type scale, with one indicating “very negative” and five indicating “very positive.”

Context

Organizational structure. The variable organizational structure was measured by assessing the workload of each team and communication mechanisms between nurse teams and social worker teams. This variable was designed by the investigator based on the literature review to assess the impact of the context variables on the collaboration process and the degree of collaboration between nurse teams and social worker teams.

To illustrate, an organization's structure includes ways that an organization assigns work to each team. Therefore, each team leader was asked questions about the workload of each nurse team and social worker team as a proxy measure for the assigned work of each team. Frequently, each team was assigned its own work as well as tasks and chores that were not part of a team's intrinsic work responsibility. Some researchers have found that tasks and chores that were not part of a team's intrinsic work responsibility excessively increased their workload (Ryu & Hwang, 2004; Yoo, 2003). Therefore, this research measured two aspects of the workload of each team, team workload from their own tasks (home visiting services) and team workload from tasks and chores that were not part of a team's intrinsic work responsibility. In order to measure these two aspects of workload, two questions were developed by the investigator based on the literature review: "Our team evaluates team workload for our own task (home visiting services) as heavy." and "Our team evaluates team workload for other tasks and chores that are not part of our work responsibility as heavy." These questions were measured using a 5-point Likert type scale, with one indicating "strongly disagree" and five indicating "strongly agree"; a high score indicated a heavier team workload.

The other construct comprising of organizational structure was communication mechanisms between nurse teams and social worker teams. The importance of a communication mechanism for collaboration has been emphasized in many studies. Thus, descriptive data concerning the communication mechanisms of each team were collected at a nominal data level by asking each team leader “What types of communication mechanisms between nurse teams and social worker teams exist? (i.e. regularly scheduled meetings, formal, written, client (patient) referrals or follow-up forms).

Team resources. The context variable of team resources affects collaboration between nurse teams and social worker teams. In this research, the team resources variable was composed of administrative support and availability of appropriate healthcare facilities or welfare institutions. Each team leader was asked about team resources. The team resource variable was measured with the Team Resource Subscale in the Scale of Barrier Factors to Offering Health and Welfare Service developed by Yoo in Korea (2003). The Team Resources Subscale composed of three items was originally designed to measure resources affecting collaboration between nurses and social workers in community settings. Two items measured sufficiency of administrative support including financial support and manpower support from a healthcare center or social welfare center. The other one item measured availability of appropriate healthcare centers or welfare centers with whom to collaborate. The three items for nurse leaders were “Our team evaluates the financial support of our organization as sufficient.”, “Our team evaluates the manpower support of our organization as sufficient.”, and “Our team does not have any difficulty in finding appropriate welfare centers with whom to collaborate.”

In the questions for leaders of social worker teams, the referent “welfare centers” was changed to “healthcare centers”. Each item was measured using a 5-point Likert type scale, with one indicating “strongly disagree” and five indicating “strongly agree”. A high score indicated more positive team resources. In Yoo’s (2003) study, the reliability of the Scale of Barrier Factors to Offering Health and Welfare Service was high with a Cronbach’s alpha of .77, but the reliability and validity of the Team Resources Subscale were not examined.

Leadership. Leadership was measured with Bass’s (1985) Multifactor Leadership Questionnaire (MLQ) translated from English to Korean by Lee (1996) and revised through a preliminary study by Park (1997). The MLQ was originally developed as a 73-item instrument with five factors indicating transformational leadership or transactional leadership. Three factors included in transformational leadership were charisma, individualized consideration, and intellectual stimulation. Transactional leadership consisted of two factors, contingent reward and management-by-exception. The reliabilities of the MLQ subscales ranged between .60 and .84 (charisma, .82; individualized consideration, .84; intellectual stimulation, .78, contingent reward, .74; and management-by-exception, .60). Construct validity was examined by eta coefficient that was converted from the resulting F-ratios through multivariate analysis, which demonstrated that the three transformational factors correlated .63 on average with each other and only .34 on average with the two transactional factors.

Applying the MLQ translated into Korean by Lee (1996) to a preliminary study to identify leadership style on nursing units, Park (1997) revised the MLQ to a 22-item

instrument encompassing five factors explaining transformational leadership and transactional leadership. Each question was measured with a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Example items are “Our leader talks a lot about special commendations and promotions for good work”, “Our leader highlights our motivation to succeed”, and “Our leader gives us a vision of what needs to be done and depends on us to fill in the details.” Higher scores of each of transformational leadership and transactional leadership were interpreted to be a stronger transformational and transactional leadership. The revised MLQ by Park (1997) demonstrated high reliability with a Cronbach’s alpha between .77 and .91 (charisma, .91; individualized consideration, .85; intellectual stimulation, .82, contingent reward, .77; and management-by-exception, .80). Content validity was examined by an expert group including three nursing professors, two nursing researchers, a nursing supervisor, a head nurse, an instructor, and four nursing graduate students in Park (1997)’s study.

Collaboration Process

To measure the collaboration process, an adaptation of the Intragroup Process of Collaboration (IPIC) Scale developed by Sicotte and his colleagues (2002) was used. The IPIC was originally composed of six domains; beliefs in the benefits associated with collaboration, cohesiveness, level of conflicts associated with collaboration, agreement with disciplinary logic, agreement with interdisciplinary logic, and work group design characteristics. However, in this study, only four domains were included: cohesiveness (4 items), level of conflicts associated with collaboration (8 items), agreement with disciplinary logic (3 items), and agreement with interdisciplinary logic (3 items). By

nature, the domain beliefs in the benefits associated with collaboration was considered to be a characteristic of team members, thus it was included as a team member's characteristic in this research. The work group design characteristics domain, such as referral forms and regular interdisciplinary meeting, was considered in this research as a context variable, organization's structure (formalized communication mechanisms). Therefore, the collaboration process between nurse teams and social worker teams was measured using four domains of the IPIC. In Sicotte and his colleagues' (2002) study, each of these four domains demonstrated high or moderate reliability with a coefficient alpha between .67 and .91 (cohesiveness, .68; level of conflicts associated with collaboration, .83; agreement with disciplinary logic, .67; and agreement with interdisciplinary logic, .90). Construct validity was examined by a principal axis factor analysis with an orthogonal rotation (varimax). The factor analysis extracted five factors including beliefs in the benefits associated with collaboration which accounted for 51.7% of the total variance of the Intragroup Process of Collaboration.

The IPIC was translated from English to Korean by the investigator in a translation study using translation and back translation procedures. In the translation study, the participants were asked to evaluate whether each item of the two versions were equivalent (range from 1, "strongly disagree" to 6, "strongly agree"). The translation study demonstrated excellent equivalence between the original English version and the Korean version presenting an equivalence mean score of 5.41.

The Korean version of the IPIC had two parallel forms; one for nurses and one for social workers. Both forms were identical in content; the referents were changed to

reflect the subject of interest. Example items of each domain for nurses are “There is high motivation to work with social workers” (cohesiveness); “There are frequent conflicts with social workers over sharing responsibilities” (level of conflicts); “Hierarchical status between the nursing discipline and the social welfare discipline exists” (agreement with disciplinary logic), and “the nursing discipline recognizes the competence of the social welfare discipline” (agreement with interdisciplinary logic). Each item in this instrument used a 5-point Likert scale, with one indicating strongly disagree and five indicating strongly agree. The domains of cohesiveness and agreement with interdisciplinary logic included positively phrased items while the domains of level of conflicts and agreement with disciplinary logic contained negatively phrased items.

Degree of Collaboration

In order to measure the degree of collaboration in the KHVS, the Intensity of Collaboration (IIC) Scale developed by Sicotte and his colleagues (2002) to measure collaboration in community health care centers was used. The IIC was translated from English to Korean by the investigator through a translation study and demonstrated excellent equivalence between the English version and the Korean version, with an equivalence mean score of 5.56 (range from 1, “strongly disagree” to 6, “strongly agree”). Thus, the Korean version of the IIC was used in this research.

The IIC was composed of two domains, care sharing activities and coordination of care services. The care sharing activities domain was measured by an 11-item scale focusing on care activities shared among interdisciplinary professionals. Sample items included “Each professional group exchanges information concerning clients with other

disciplinary groups” and “Each professional group cooperates with other disciplinary groups to ensure client follow-up”. The coordination of care services domain was measured by a 7-item scale focusing on work routines and facilitating coordination among various groups of professionals. Sample items included “Sharing responsibility is well established among the different professional groups” and “Professionals provide their own care without interfering with each other.”

Both of the subscales together measured the degree of collaboration using a 5-point Likert type scale, with one indicating “strongly disagree” and five indicating “strongly agree”. In the Sicotte and his colleagues’ (2002) research, the IIC scale demonstrated high reliability with a coefficient alpha for care sharing activities and coordination of care services of .88 and .83, respectively. Construct validity was examined by a principal axis factor analysis with orthogonal rotations (varimax) and the two domains explained 43.6 % of the total variance of the Intensity of Collaboration.

Additional Descriptive Data

Demographic data from each nurse and social worker such as age, gender, discipline, education level, prior experiences in collaborative work, and work settings were collected. Among demographic data, experience in collaborative work was considered a variable of team member’s characteristics; other data were used to describe the research sample.

Study Procedures

Once a team leader agreed to participate, the investigator provided each team member with a packet of survey instruments and a Subject Disclaimer Form at their regular team meeting. The packet explained in detail the purpose, importance, and procedures of the research and participant's right. The investigator reviewed all of these materials during the meeting. Potential participants were given 2 weeks to think about and thoroughly review the disclaimer and all questionnaires. If all team members were willing to participate, they were asked to complete the self-report surveys in a comfortable place and at a convenient time. After completing the survey, the participants were asked to place completed questionnaires in a sealed envelope and place it in a locked box which the investigator had placed in team members' offices. After two weeks, the investigator visited the offices and took the completed questionnaires. If all the surveys had not been completed, team members were reminded to complete them at their next regular team meeting. The remaining completed questionnaires were collected one or two weeks after the reminder. Each survey was identified with a number to distinguish between nurse teams and social welfare teams, but no other team member identifiers were used to tie a team member to a survey.

Data Collection

Individual and Team Data Collection

Demographic data of team members were obtained from individual nurses and social workers. Data on the characteristics of each team member such as beliefs in the benefits of collaboration, perception of other professions, individual ability, and

collaboration experience were also collected. Team data such as a team leader's leadership, cohesiveness, level of conflicts associated with collaboration, agreement with disciplinary logic, agreement with interdisciplinary logic, care sharing activities, and coordination of care services were also collected from each team member.

Organizational Data Collection

Data of organizational structure including team workload, communication mechanisms and team resources including administrative support and availability of appropriate healthcare centers or welfare centers were collected from team leaders.

Data Analysis

The following section discusses data analysis, including analysis at both individual level and team level. Criteria for aggregating data obtained from individual team members to the team level are detailed. Data were analyzed using the statistical package SPSS 15.0 for Windows. As a first step in the data analysis, all data were examined for data entry errors and errors were corrected if necessary.

Individual Level Analysis

Descriptive statistics were used to assess each variable of the four components, team member, context, process and degree (outcomes), in the collaboration model. Data were analyzed through means, standard deviations, percentiles, and minimum/maximum/ranges. All measures were examined for reliability and validity at the individual level. Reliability was examined using Cronbach's alpha with criteria of .70 or higher inter-item correlation than .30 in 40-50% of items. Construct validity was examined using factor analysis.

Team Level Analysis

The focal analysis level was the team level because the research constructs of interest were team level variables. Thus, all team data including team member's characteristics, context, collaboration process, and degree of collaboration (outcomes) variables collected from individual nurses and social workers were analyzed at the team level. In order to analyze data collected from individuals at the team level, it was necessary to aggregate the data to the team level. There are four criteria to assure that the aggregation of data measured at one level into a higher level is a good indicator of the higher group: content validity, representativeness, reliability, and validity (Verran, Gerber, & Milton, 1995).

All instruments and scales were examined for content validity to assure that item referents were at the focal analysis level, the team level. All items of the instruments and scales had a team level referent, so they met the first criterion for aggregation, content validity. In order to assure the representativeness of the aggregated data, a response rate of at least 50% has been recommended for most situations (Verran et al., 1995). However, a response rate of at least 50% was not appropriate for this research because most social worker teams were composed of a small number of members (two, three or four) while most nurse teams consisted of 5-12 persons. Generally, it is not acceptable that one person on a team of two represents the team although the response rate is 50%. A response rate of more than 50% is reasonable when a team has a small number of members. Thus, a response rate of at least 80% was considered to be adequate for team representation in this research.

Multiple criteria were used to examine the reliability and validity of the aggregated data. Reliability of the aggregated data was examined by the Intraclass Correlation Coefficient (ICC). The ICC is an estimation of how different the within group variability is from the between group variance (Verran et al., 1995). An ICC of at least .60 was used in this research.

Construct validity of the aggregated data was estimated using the measure of agreement (r_{wg}) (Verran, Mark, & Lamb, 1992). Generally, an average r_{wg} value of at least .70 or greater is recommended as a criterion for justifying aggregation to the team level, thus an average r_{wg} value of at least .70 was used in this study.

Statistical Analysis

Path analysis was conducted using a stepwise multiple regression technique to test the hypothesized model. Path analysis is a multivariate method that uses regression analysis to test predicted and non-predicted relationships among the observed model variables and answers questions regarding the relationships between a set of independent variables and a dependent variable (Munro, 2001). In the hypothesized collaboration model, stepwise multiple regressions were conducted to test each predicted relationship between independent variables and dependent variables, including 1) between variables of team member and context and variables of collaboration process and 2) between variables of team member, context, and collaboration process and variables of the degree of collaboration.

Summary

A descriptive design using a causal modeling approach was used to test the collaboration model proposed in this study. The research settings were the public healthcare centers and welfare centers in five provinces of Korea. 40 nurse teams and 40 social worker teams were invited to participate in this research. Data were collected from each team member and leaders involved in the KHVS using seven instruments. All team data were analyzed at the team level. Descriptive statistics were used to assess each variable of the four components, team member, context, collaboration process and degree of collaboration (outcomes) in the collaboration model. A stepwise multiple regression technique was used to test the hypothesized model.

CHAPTER 4: RESEARCH FINDINGS

The purpose of this chapter is to describe the results of the study. This section depicts sample characteristics, specifically examines all variables in the hypothesized model at both the team member's level and team level, and discusses study results relevant to the research hypotheses. Additional analyses which tested relationships between dependent variables and unpredicted demographic variables such as age, duration as nurses or social workers, and duration participating in the KHVS were also examined.

Sample Characteristics

Instruments were distributed to 544 potential participants. They were 337 nurses and 40 nurse leaders in 40 Korean healthcare centers and 127 social workers and 40 social worker leaders in 40 Korean welfare centers. The total response rate was 90.8% (n=494). Responses were from 295 nurses, 40 nurse leaders, 119 social workers, and 40 social worker leaders. Demographic characteristics of the total sample are presented in Table 2. The sample consisted of 414 team members and 80 team leaders. The team members group had a mean age of 36.0 years (SD, 7.90 yrs), were mainly comprised of nurses (71.26%), were female (89.9%), and over half (56.3%) had an associate level of education. The team members reported a mean duration as nurses or social workers of 8.5 years (SD, 6.12 yrs) and a mean duration participating in the KHVS of 2.1 years (SD, 2.49 yrs). Over half (51.4%) had collaboration experience.

The team leaders group was composed of 40 nurse leaders and 40 social worker leaders; they had a mean age of 40.48 years (SD, 8.0 yrs), were mainly female (77.5%),

and had a baccalaureate education level (53.8%). The team leaders reported a mean duration as nurses or social workers of 14.15 years (SD, 9.0 yrs), a mean duration participating in the KHVS of 3.85 years (SD, 3.28 yrs), and a mean duration as a team leader of 2.35 years (SD, 2.15 yrs). Over half (57.5%) had collaboration experience.

TABLE 2. Sample Characteristics (N=494)

Characteristic	Team Members Total(n=414)		Team Leaders Total(n=80)	
	Frequency	Percent	Frequency	Percent
Team				
Nurses	295	71.26	40	50.0
Social Workers	119	28.74	40	50.0
Age	Mean:36.0±7.90years		Mean:40.48±8.00years	
Gender				
Female	372	89.9%	62	77.5%
Male	42	10.1%	18	22.5%
Education				
Associate Degree	233	56.3%	20	25.0%
Baccalaureate Degree	161	38.9%	47	53.8%
Graduate Degree	20	4.8%	13	16.3%
Duration as nurses or social workers	Mean:8.5±6.12years		Mean:14.15±9.0years	
Duration participating in the KHVS	Mean:2.1±2.49years		Mean:3.85±3.28years	
Duration as a team leader			Mean:2.35±2.15years	
Collaboration Experience				
Yes	213	51.4%	46	57.5%
No	201	48.6%	34	42.5%

Variables at Individual Level in the Hypothesized Model

The hypothesized model, constructed of the four components, was presented in Figure 1. Reliability and validity for each instrument were assessed prior to statistical analysis. Cronbach's alpha and inter-item correlations were used to evaluate reliability and factor analysis was used to evaluate validity. The following sections and Table 3 describe the reliability and validity of each instrument used.

Team Member

Beliefs in the benefits of collaboration. The Beliefs in the Benefits of Collaboration Scale, composed of five items, was used to assess team members' beliefs in the benefits of collaboration. Cronbach's alpha was .81, demonstrating the scale's high internal consistency. The scale also met the criteria for inter-item correlations that 40-50% of items should have higher correlations than .30; 100% of inter-item correlations were greater than .30. Thus, all scale items were retained for the total scale. Using principal component factor analysis, all items loaded on only one factor, demonstrating 62.22% of total explained variance. Therefore, this scale was deemed to be reliable and had support for its validity.

TABLE 3. Reliability and Validity at Individual Level

Construct	Variable	Reliability Cronbach's alpha	Validity Explained Variance
Team	Beliefs in the benefits of collaboration	.81	62.22%
Member	Perception toward other professions	.89	62.77%
			F1) 32.40%, F2) 30.37%
	F1) Perception toward other profession's ability	.85	57.13%
	F2) Perception toward other profession's relationship	.83	66.27%
Context	Individual ability	N/A	81.34%
	Team workload	N/A	70.0%
	Communication mechanisms	N/A	N/A
	Administrative support	N/A	63.1%
	Availability of facilities	N/A	N/A
	Transformational leadership	.95	58.39%
			f1) 21.07%, f2) 37.32%
	f1) Charisma	.84	51.21%
	f2) Individual consideration & stimulus	.94	58.05%
	Transactional leadership	.81	57.77%
			FA1)23.64%, FA2) 21.13%, FA) 13.00%
	FA1) Active management-by-exception	.82	54.42%
	FA2) Contingent reward-by-exception	.81	63.37%
	FA3) Passive management	.60	45.67%
Process		.76	62.10%
		(except agreement of disciplinary logic)	Fa1) 11.10%, Fa2)20.43%, Fa3) 30.59 %
	Fa1) Group cohesiveness	.70	51.36%
	Fa2) Level of conflicts	.79	61.73%
	Agreement of disciplinary logic	.49	N/A
	Fa3) Agreement of interdisciplinary logic	.79	70.57%
Degree		.92	57.35%
			Fac1) 32.79%, Fac2)24.56%
	Fac1) Care sharing activities	.89	54.41%
	Fac2) Coordination of care services	.89	60.61%

Perception toward other professions. The Interprofessional Perception Scale was used to identify how nurse and social worker teams viewed each other. The total 15 items had a Cronbach's alpha of .82, however, some reversed items, 5, 7, 8, 9, 11 had very low inter-item correlations. For example, more than 60% of inter-item correlations in the five items were lower than .30; therefore, they were deleted to improve reliability. Cronbach's alpha of the revised scale with only 10 items was improved to .89, demonstrating the scale's high internal consistency. In addition, the revised scale met the criteria of inter-item correlations, showing that 90% of inter-item correlations were greater than .30. Factor analysis of the original scale had not been conducted in previous studies. However, the revised scale with 10 items loaded well on two factors which were perception toward other professions' ability and perception toward other profession's relationship, demonstrating 57.13% and 62.77% of each total explained variance, respectively. Therefore, the revised scale was considered reliable and had support for its validity.

Individual ability. The Individual Ability Subscale in the Scale of Barrier Factors to Offering Health and Welfare Service was used to measure each team member's ability to collaborate. It was composed of two items. Cronbach's alpha for the subscale was not examined since Cronbach's alpha test is applicable to a measurement composed of at least three items; thus, reliability of the subscale was tested with inter-item correlation and was assured, showing a .63 correlation between two items. The two items loaded well on one factor, demonstrating 81.34% of total explained variance; thus, this subscale was reliable and had support for its validity.

Prior collaboration experience. Within the demographic data, prior collaboration experience was used as a variable of team member's characteristics, while other demographic data were used to describe the research sample.

Context

Organizational structure. The organizational structure was composed of two domains, team workload of each team and communication mechanisms between nurse teams and social worker teams. Team workload was measured with two items developed by the investigator to assess each team's own workload (home visiting services) and tasks that were not part of their own intrinsic work responsibility. Cronbach's alpha of team workload was not examined because it was composed of two items; thus, the reliability was tested with inter-item correlation and was assured, showing a significant correlation between two items ($r=.40$). The two items loaded on one factor explaining 70.0% of total explained variance.

Communication mechanisms between nurse team and social worker teams was measured as nominal level data by asking a question about types of communication mechanisms between nurse teams and social worker teams. Cronbach's alpha and factor analysis for communication mechanisms were not examined because this variable was composed of only one item and involved nominal level data.

Team resources. The Team Resources Subscale was composed of two domains, administrative support composed of two items and availability of facilities to collaborate composed of only one item. It was completed by team leaders to identify the sufficiency of administrative support including financial support and manpower support from a healthcare center or social welfare center and the availability of appropriate healthcare centers or welfare centers with which to collaborate. Cronbach's alpha for the administrative support domain was not examined because it was composed of two items. The reliability of the administrative support domain was tested through an inter-item correlation. The domain had a .26 correlation between two items and loaded on one factor explaining 63.1% of total explained variance. For the availability of facilities to collaborate domain, reliability and validity were not tested since it was composed of only one item.

Leadership. The Multifactor Leadership Questionnaire (MLQ) Scale was used to measure transformational leadership and transactional leadership. The Transformational Leadership Subscale, composed of 20 items, had a Cronbach's alpha of .95; however one item had a very low inter-item correlation, showing that 50% of inter-item correlations were lower than .30. Thus, the item was deleted to improve reliability. Cronbach's alpha of the revised Transformational Leadership Subscale with 19 items was .95 which was the same as the original scale composed of 20 items; but the revised subscale met the criteria of inter-item correlations, showing that 92% of inter-item correlations were greater than .30. In addition, 19 items loaded well on two factors, charisma and individual consideration and stimulus, demonstrating 58.39% of total explained variance. Therefore,

the revised Transformational Leadership subscale was deemed to be reliable and had support for its validity.

The Transactional Leadership Subscale composed of 16 items had a Cronbach's alpha of .81. However, two items had low inter-item correlation, showing that more than 40% of inter-item correlations were lower than .30; thus, the two items were deleted. The revised Transactional Leadership Subscale consisted of 14 items and showed a Cronbach's alpha of .81, which was the same as the original Transactional Leadership subscale. However, the revised subscale met the criteria of inter-item correlations, showing that 50% of inter-item correlations were greater than .30. Using principal component factor analysis, 14 items loaded well on three factors, contingent reward, active management-by-exception, and passive management-by-exception, demonstrating 57.77% of total explained variance. Therefore, this revised Transactional Leadership Subscale was reliable and had support for validity for the current study.

Collaboration Process

Collaboration process was measured with four subscales, Cohesiveness, Level of Conflicts, Agreement of Disciplinary Logic, and Agreement of Interdisciplinary Logic. Cronbach's alphas of each subscale were .70, .74, .43, and .79, respectively. Some items in the domains of level of conflicts and agreement of disciplinary logic had low inter-item correlation. For example, 56% of inter-item correlations had lower than .30 for three items of the Level of Conflicts Subscale and one item of the Agreement of Disciplinary Logic subscale. Thus, the four items were deleted to improve the reliability of each subscale. The revised Level of Conflicts subscale had a slight improvement of

Cronbach's alpha with the value of .79 and met the criteria of inter-item correlations, showing that more than 50% of inter-item correlations were greater than .30. However, the Agreement of Disciplinary Logic Subscale still showed a low value of Cronbach's alpha with .49. Thus, the Agreement of Disciplinary Logic subscale was not found to be reliable, so it was eliminated in further analysis. Factor analysis was performed with three domains, cohesiveness, level of conflicts, and agreement of interdisciplinary logic, which demonstrated 62.10% of total explained variance for collaboration process. In addition, each domain loaded well on one factor with good explained variance.

Degree of Collaboration

The degree of collaboration was measured with two subscales, Care Sharing Activities and Coordination of Care Services. Cronbach's alphas for the subscales were .89 and .87, respectively. However, 51% of inter-item correlations showed lower than .30 in two items of the care sharing activities and one item of the coordination of care services. Thus, the three items were deleted to improve reliability. Although the items having lower inter-item correlations were deleted, Cronbach's alphas of the revised subscales were not significantly improved, but still had high Cronbach's alphas (care sharing activities=.89 and coordination of care services =.89).

Using factor analysis, the degree of collaboration scale was represented by two factors, care sharing activities and coordination of care services, demonstrating 57.35% of total explained variance. Each domain loaded well on one factor with good explained variance (care sharing activities=54.41% and coordination of care services =60.61%). Thus, the two subscales for the degree of collaboration were deemed to be reliable and

had support for their validities. Based on the above psychometric analysis for four constructs in the hypothesized model, the proposed research model was modified as shown in Figure 2.

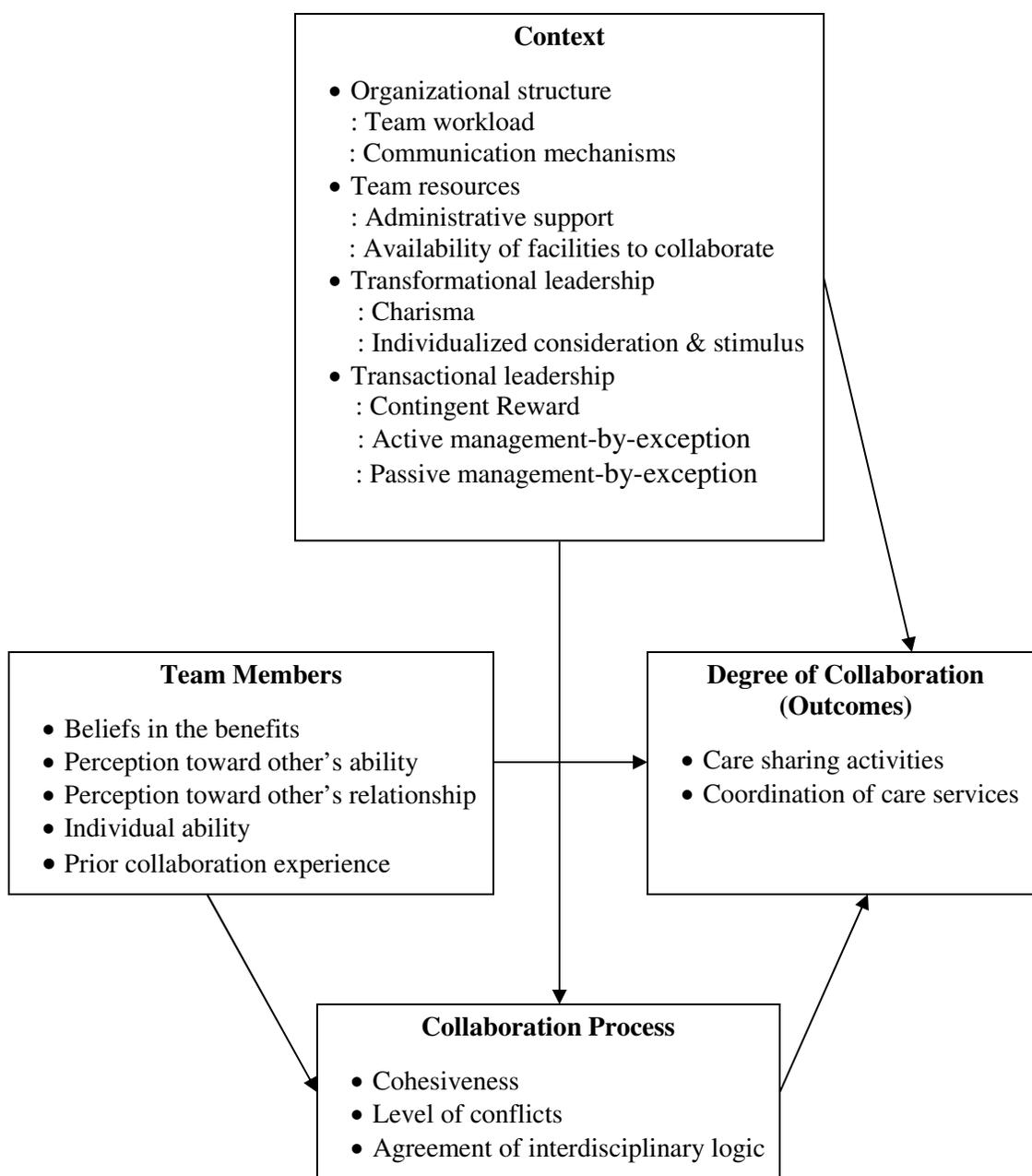


FIGURE 2. Revised Collaboration Model

Variables at the Unit Level in the Hypothesized Model

Most variables in the hypothesized model were measured at the individual level (team member level); however, the focal analysis level in this research was the team level because the research constructs of interest were team level variables. Thus, team member responses were aggregated, with the mean expressed as a team value. In order to assure that the aggregation of data measured at the individual level into team level was a good indicator of the team, content validity, representativeness, reliability, and validity were assessed prior to subsequent statistical analysis. Team level content validity was assured as all instruments contained a team referent. Representativeness was assured because all teams showed a greater than 80% response rate. Reliability and validity were assessed with Intraclass Correlation Coefficients (ICCs) and r_{wg} . All ICCs and r_{wg} for aggregated variables are presented in Table 4.

ICCs were calculated using the formula: $ICC = (BMS - WMS) / BMS$ (BMS: between mean square from a one-way ANOVA, WMS: within mean square from the one-way ANOVA). ICCs of perception toward other profession's ability, charisma, individualized consideration and stimulus, and contingent reward met the recommended requirement of .60 for aggregation. Except for the four variables, the ICCs of most variables were less than the recommended requirement of .60, with beliefs in the benefits of collaboration at .29, perception toward other profession's relationship at .39, individual ability at .25, prior collaboration experience at .31, active management-by-exception at .51, passive management-by-exception at .42, cohesiveness at .36, level of conflicts at .44, agreement of interdisciplinary logic at .52, care sharing activities at .40,

and coordination of care services at .30. Thus, between-team variances were not significantly larger than the within-team variances in those variables, and aggregated team means were not reliable indicators of team agreement using ICCs for them.

However, r_{wg} to assess within-team agreement justified aggregation of all variables because all aggregated variables met the criterion for aggregation with greater than .70 of an average r_{wg} , with beliefs in the benefits of collaboration = .93, perception toward other profession's ability = .94, perception toward other profession's relationship = .88, individual ability = .77, prior collaboration experience = .80, charisma = .99, individualized consideration and stimulus = .98, contingent reward = .93, active management-by-exception = .93, passive management-by-exception = .91, cohesiveness = .88, level of conflicts = .77, agreement of interdisciplinary logic = .89, care sharing activities = .93, and coordination of care services = .94. Therefore, there was sufficient evidence for aggregating team members' responses to the team level, and use of the mean was an appropriate measure for the team response. While team member responses were aggregated, organizational structure variables (team workload and communication mechanisms) and team resources variables (administrative support and availability of facilities) of context were not aggregated because those variables were collected from team leaders.

Table 4 also shows mean scores of each variable except communication mechanisms of context because it was nominal data. The mean scores using a 5-point Likert type scale were interpreted as one indicating "strongly negative" and five indicating "strongly positive"; however for one variable, "level of conflicts", the higher

the score, the higher the level of conflicts. All variables were on the positive side of the scale except administrative support (mean: 2.43). The mean scores of some variables (team resources, level of conflicts, and the degree of collaboration including care sharing activities and coordination of care services) were more modest than other variables and were below 3.0. As for the variable, communication mechanisms, formal forms (38.5%) was the most used between nurse teams and social worker teams, followed by both regular meeting and informal referral (23.1%), regular meeting (12.8%), informal meeting (12.8%), both regular meeting and formal forms (10.3%), and both of formal forms and informal referral (2.5%). The communication mechanisms variable was converted into dummy variables for the multiple regressions to identify what communication mechanism significantly impacted the collaboration process and the degree of collaboration.

TABLE 4. Agreement Indices, Means and Standard Deviations at Team Level

Construct	Variable	ICC	r_{wg}	Mean	S.D
Team	Belief in the benefits of collaboration	.29	.93	3.75	.37
Member	Perception toward other profession			3.12	.41
	Perception toward other profession's ability	.61	.94	3.19	.44
	Perception toward other profession's relationship	.39	.88	3.05	.43
	Individual ability	.25	.77	3.38	.41
	Prior collaboration experience	.31	.80	3.56	.63
Context	Organizational structure				
	Team workload	N/A	N/A	3.55	.78
	Communication mechanisms	N/A	N/A	N/A	N/A
	Team resources			2.74	.78
	Administrative support	N/A	N/A	2.43	.87
	Availability of facilities	N/A	N/A	3.05	1.08
	Transformational leadership			3.54	.46
	Charisma	.66	.99	3.51	.49
	Individualized consideration & stimulus	.61	.98	3.58	.46
	Transactional leadership			3.61	.38
	Contingent reward	.61	.93	3.45	.52
	Active management-by-exception	.51	.93	4.12	.49
	Passive management-by-exception	.42	.91	3.24	.40
Process				3.63	.28
	Cohesiveness	.36	.88	3.47	.33
	Level of conflicts	.44	.77	2.12	.50
	Agreement of interdisciplinary logic	.52	.89	3.43	.49
Degree				2.91	.41
	Care sharing activities	.40	.93	2.94	.46
	Coordination of care services	.30	.94	2.87	.41

Results of Hypothesis Analysis

The revised hypothesized model contained two hypotheses: 1) team member's characteristics and context variables have a significant direct effect on the collaboration process (cohesiveness, level of conflicts, and agreement interdisciplinary logic) and 2) team member's characteristics, context variables, and collaboration process variables have a significant direct effect on the degree of collaboration (care sharing activities and coordination of care services).

Path analysis was used to not only examine the hypotheses but also determine the magnitude of the paths and the explanatory power of causal relationships in the proposed model. The stepwise method for multiple regressions was used to include only the significant variables in the equation and to exclude the non-significant variables for the equation. Figure 3 presents the findings of path analysis at the significance level of .05. R^2 s of significant paths for each dependent variable were also presented in Figure 3.

Hypothesis One

In the first stepwise regression, three variables of the collaboration process, cohesiveness, level of conflicts, and agreement of interdisciplinary logic were regressed on all five team member variables and thirteen context variables including five dummy variables for communication mechanisms. First, *cohesiveness* was significantly influenced by beliefs in the benefits of collaboration and perception toward other professions' relationship with 36.1% of total variance explained for the cohesiveness ($p < .005$). The stronger was the beliefs in the benefits of collaboration and the more positive was the perceptions toward other professions' relationship, the higher was the

cohesiveness. Beliefs in the benefits of collaboration had higher explanation ($\beta=.32$) for cohesiveness than perception toward other professions' relationship ($\beta=.29$).

Second, *level of conflicts* was not influenced by any team member's characteristics and context variables. However, when other demographic data not specified in the original hypothesized model were added level of conflicts was influenced by duration as nurses or social workers and duration participating in the KHVS, with 29% of total variance explained for the level of conflicts ($p<.005$). The longer the duration as nurses or social workers, the higher the level of conflicts. In contrast, the longer the duration participating in the KHVS, the lower the level of conflicts. Specifically, duration participating in the KHVS ($\beta=-.14$) had higher explanation for level of conflicts than duration as nurses or social workers ($\beta=.05$).

Third, *agreement with interdisciplinary logic* was significantly influenced only by perception toward other profession's ability and explained 41% of total variance for the agreement of interdisciplinary logic ($p<.001$). The more positive the perception toward of other profession's ability, the higher the agreement of interdisciplinary logic ($\beta=.63$). Based on the results of first regression, Hypothesis one, team member's characteristics and context variables have a significant direct effect on the collaboration process, was rejected. However, some team member variables directly impacted the collaboration process.

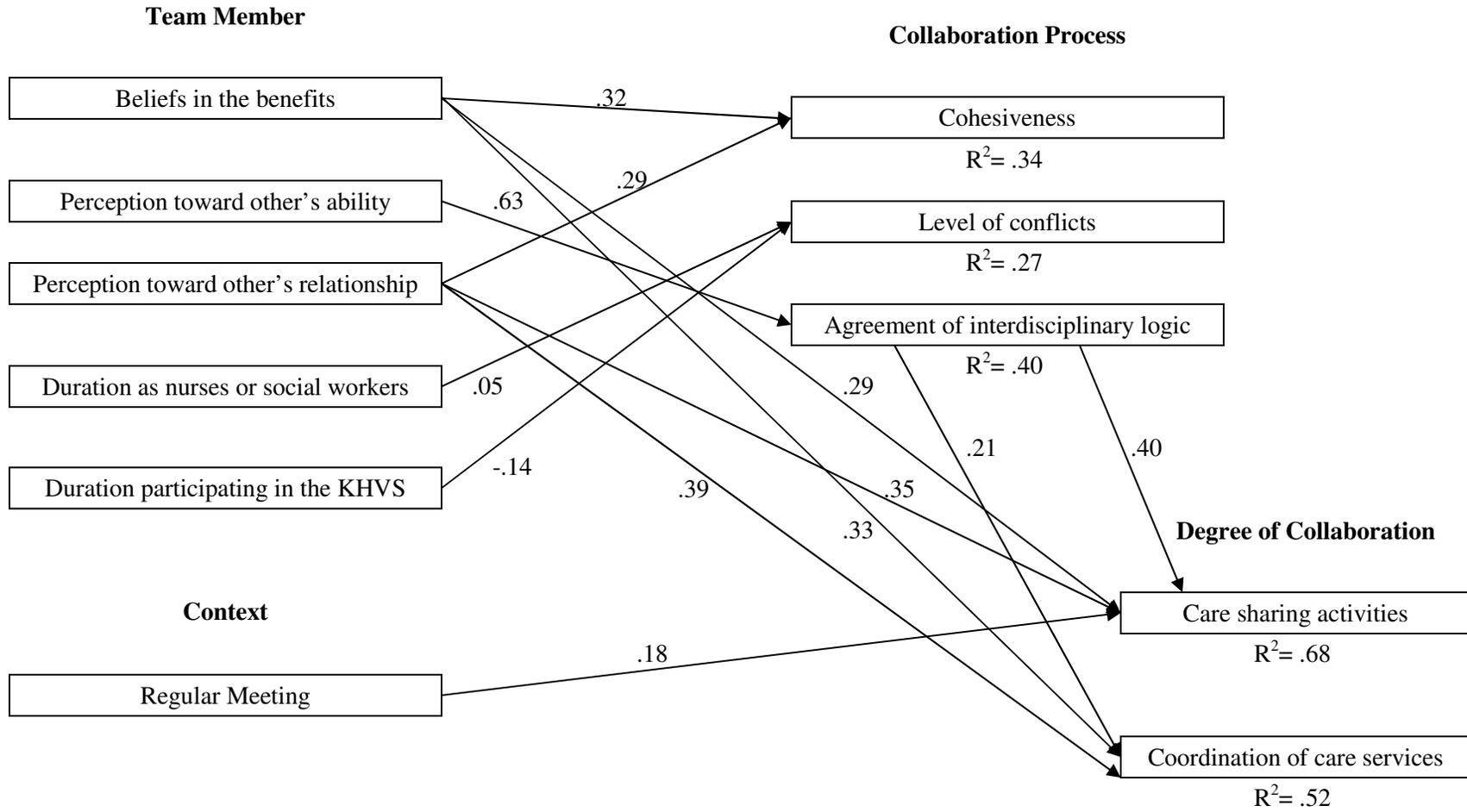


FIGURE 3. Path Analyses

Hypothesis Two

In the second stepwise regression, the two variables of the degree of collaboration (care sharing activities and coordination of care services) were regressed on all five team member variables, thirteen context variables, and three collaboration process variables. *Care sharing activities* was significantly influenced by beliefs in the benefits of collaboration, perception toward other profession's relationship, regular meeting as a communication mechanism, and agreement of interdisciplinary logic which accounted for 70% of total variance for the care sharing activities ($p < .05$). The stronger was the beliefs in the benefits of collaboration, the more positive was the perception toward other profession's relationship, the more was the regular meetings, and the higher was the agreement of interdisciplinary logic, the more was the care sharing activities. Agreement of interdisciplinary logic ($\beta = .40$) had higher explanation for care sharing activities than beliefs in the benefits of collaboration ($\beta = .29$), perception toward other profession's relationship ($\beta = .35$), or regular meeting as a communication mechanism ($\beta = .18$).

Coordination of care services was significantly influenced by beliefs in the benefits of collaboration, perception of other profession's relationship and agreement of interdisciplinary logic that explained 54% of total variance for the coordination of care services ($p < .05$). The stronger was the beliefs in the benefits of collaboration, the more positive was the perception toward other profession's relationship, and the higher was the agreement of interdisciplinary logic, the more was the coordination of care services. Specifically, perception toward other profession's relationship ($\beta = .39$) had higher explanation for the coordination of care services than beliefs in the benefits of

collaboration ($\beta=.33$) or agreement of interdisciplinary logic ($\beta=.21$). Based on the results of second regression, Hypothesis two, team member's characteristics, context variables, and collaboration process variables have a significant direct effect on the degree of collaboration, was rejected. However, some team member, context, and collaboration process variables directly impacted the degree of collaboration.

Based on the path analysis, the final collaboration model for elders in community settings was presented in Figure 4. Most team member's variables, beliefs in the benefits of collaboration, perception toward other professions' ability, perception toward other professions' relationship, duration as nurses or social workers, and duration participating in the KHVS had a direct influence on the collaboration processes (cohesiveness, level of conflicts, and interdisciplinary logic). Context variables did not have any influence on the collaboration processes.

As for outcomes, two team member variables (beliefs in the benefits of collaboration and perception on other's relationship) and one context variable (regular meeting as a communication mechanism) had a direct influence on the degree of collaboration. Only agreement of interdisciplinary logic among the collaboration processes variables had a significant influence on the degree of collaboration.

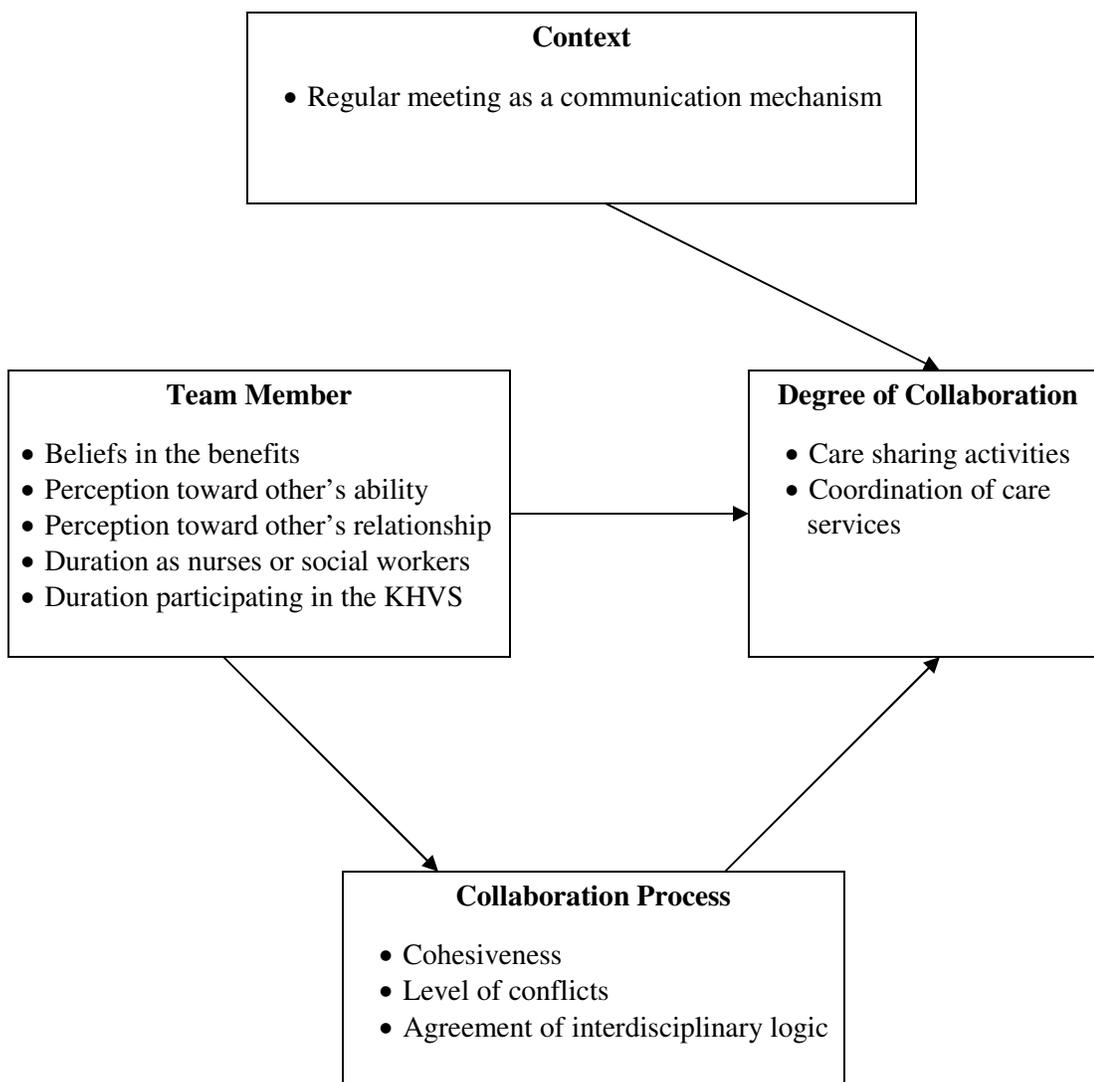


FIGURE 4. Final Collaboration Model

Summary

This research tested a causal collaboration model to identify collaboration between nurse teams and social worker teams working with elders in community healthcare and social welfare centers. All measures were assessed at both the individual and team levels for psychometric analysis. Path analysis was used to examine the hypotheses and determine the magnitude of the paths and explanatory power of causal relationships in the proposed model. The original, hypothesized collaboration model was not supported by the data since the research hypotheses were rejected. However, some team member variables significantly impacted the collaboration process as well as some team member, context, and collaboration process variables directly impacted the degree of collaboration. Thus, the hypothesized collaboration model was revised.

CHAPTER 5: DISCUSSION

The purpose of this study was to test a hypothesized causal model of collaboration. Prior to testing the hypothesized model, measurements of the psychometric properties utilized for four constructs in the model were examined at both the individual and team levels to assure the reliability and validity of all instruments. Subsequently, the impact of team member's characteristics and context variables on the collaboration process and the impact of team member's characteristics, context variables, and collaboration process variables on the degree of collaboration were examined with path analysis using multiple regressions. This chapter discusses the study results, study implications for further research and practice, and study limitations. The study results are discussed in terms of constructs in the hypothesized model and research hypotheses.

Constructs in the Hypothesized Model

The measurements of psychometric properties utilized for the research construct variables have been used in previous studies (M. Lee, 1999; Park, 1997; Rhee et al., 2006; Sicotte et al., 2002; Yoo, 2003). Although previous studies aggregated data measured at individual level into team level or organizational level they did not examine whether the aggregation of data was a good indicator of the team or organization. Generally, an assessment of the reliability and validity of measurements using individual level responses only describes the behavior of the measurements at the individual level and gives little information about their performance at the group level or organizational level (Verran et al., 1992). Thus, psychometric examination of the measurements using aggregated data was critical. Using four criteria, content validity, representativeness,

reliability, and validity, this study examined whether the aggregation of data measured at the individual level into a team level was a good indicator of the team. Therefore, the research findings of this study may be more reliable and valid than previous studies. The following section discusses the reliability and validity of each measurement for four constructs in the model and descriptive statistics (mean scores) of each variable in the constructs by comparing those used in previous studies.

Team Member

Beliefs in the benefits of collaboration. Beliefs in the Benefits of Collaboration Scale was reliable with a Cronbach's alpha of .81 and had support for its validity, loading well on only one factor. This is consistent with the results from Sicotte and his colleagues' (2002) study in which the scale was also found to be reliable and valid. The mean score of beliefs in the benefits of collaboration was moderately high (3.75) but lower than that in Sicotte and his colleagues' (2002) study (over 4.15). However, this lower belief score may, in part, be due to the KHVS' collaboration program having been initiated in 1999 whereas the programs in the Sicotte and his colleagues' (2002) study were implemented in 1977. In general, community-based programs with a long history have been revised and improved over the years, which might lead to more positive beliefs in the benefits of collaboration. Thus, the mean score of 3.75 in this research was considered good.

Perception toward other professions. The revised Interprofessional Perception Scale (IPS) was reliable with a Cronbach alpha of .89. In previous studies, which utilized the original IPS, Cronbach's alpha was .81 and content validity was examined by an

expert group (Ducanis & Golin, 1979; Lee et al., 2006). However, those studies did not examine construct validity, so they did not have any information about specific constructs of perception toward other professions, which, in turn, may limit the ability to specifically identify perception toward other professions. In the present study, construct validity of the IPS was examined using factor analysis; two factors were found, perception toward other professions' ability and perception toward other profession's relationship. This finding may be more useful to understand specific constructs of perception toward other professions than previous studies.

The mean score for perception toward other professions was 3.12, which indicated a moderately positive perception toward other professions. More specifically, perception toward other profession's ability (3.19) was a little higher than perception toward other profession's relationship (3.05). The mean score of total perception toward other professions was similar to that in Rhee and her colleagues' (2006) study (3.29). This similarity was not surprising since both studies had similar attributes in terms of research samples and settings. The research sample of Lee and her colleagues' (2006) study was also comprised of nurses and social workers involved in the KHVS and the research setting was healthcare and welfare centers in one Korean province.

Individual ability. Individual ability to collaborate with other disciplinary teams was measured with the Individual Ability Subscale in the Scale of Barrier Factors to Offering Health and Welfare and composed of two items. In a study by Yoo (2003), the reliability and validity of the subscale were not examined; only reliability of the total Scale of Barrier Factors to Offering Health and Welfare Service was examined. However,

this research examined the subscale's reliability with inter-item correlation and found high inter-item correlation of the subscale. In addition, this research assessed and assured the subscale's construct validity using factor analysis; thus, this research provided evidence for the subscale's reliability and validity that was lacking in the previous study.

The mean score of individual ability was 3.38, which is similar to that in Yoo's (2003) study (3.00). This similarity may be attributed to the similarity of the research samples and settings of both studies. The research sample of Yoo's (2003) study was also nurses and social workers in the KHVS and research settings were healthcare and welfare centers in one Korean city.

Context

Organizational structure. Organizational structure was composed of two domains, team workload and communication mechanisms between nurse teams and social worker teams. Team workload domain was measured with two items; one measured a team workload for their own tasks (home visiting services), and the other measured a team workload for other tasks and chores that were not part of their work responsibility. Since the domain was composed of two items Cronbach's alpha was not examined. A small number of items for team workload may be insufficient to investigate the impact of team workload of each team on collaboration; thus, more items might be needed to measure comprehensively team workload.

As for the mean score of team workload, this research reported a slightly high mean score of 3.55; this indicated that each team carried a rather heavy workload. Specifically, team workload for their own tasks (home visiting services) (3.91) was

considered heavier than that for other tasks and chores that were not part of their work responsibility (3.19). These findings are similar to other studies where the majority of nurses and social workers providing healthcare and welfare services in Korean community settings reported heavy workloads and manpower shortages as key barriers to offering healthcare and welfare services (Ko et al., 2002; Rhee et al., 2006; Yoo, 2003). It can be concluded that the heavy workload of healthcare providers prevents them from providing adequate healthcare and welfare services in Korean community settings.

The other domain, communication mechanisms, was assessed through nominal level data, and the reliability and validity for the communication mechanisms were not examined because it was composed of only one item and was nominal level data. More items might be needed to sufficiently reflect the communication mechanisms between disciplinary teams. In this study, formal forms were the most used communication mechanism between nurse teams and social worker teams. However, in Yoo's (2003) study, informal referrals was the most frequently used. This difference may be explained by the fact that Yoo investigated communication mechanisms between nurse and social worker teams in the KHVS in 2000, shortly after the referral system for communication mechanisms was begun and referral mechanisms may not have been fully developed and implemented. By 2007, when this study was conducted, a formal referral system had been implemented for several years; thus, it is highly plausible that formal forms were the most used in this research.

Team resources. Team resources were measured with the Team Resources Subscale of Barrier Factors to Offering Health and Welfare Service Scale. Team

resources were composed of two domains, administrative support composed of two items and availability of facilities to collaborate composed of one item. Unlike Yoo's (2003) study that did not examine the reliability and validity of the Team Resources Subscale (Yoo, 2003), this research examined the subscale's reliability and validity with inter-item correlation and factor analysis. Cronbach's alpha for the administrative support domain was not tested since it was composed of only two items. The administrative support domain had low inter-item correlation between two items (.26); however, it was used in further analysis because administrative support was an important variable to identify team resources. Construct validity of the administrative support domain was assured through factor analysis. For the availability of facilities to collaborate domain, reliability and validity were not tested since it was composed of only one item. In order to better explain the attributes of team resources, it will be necessary in further research to add more items.

The mean score of team resources was 2.74, which indicated that teams involved in the KHVS had moderate team resources. This score was higher than that in Yoo's (2003) study (1.26), which is interesting considering the different research settings of the two studies. This research had more heterogeneous settings in that it was conducted in two rural provinces and three large cities, while Yoo's (2003) study was conducted in only one large city. Although it is common that team resources in large cities are better than those found in provinces, there are also higher demands for team resources to provide care services to more clients in large cities. Thus, it may be concluded that large cities need more team resources when considering the ratio of supply to demand.

Leadership. Leadership, composed of transformational leadership and transactional leadership, was measured with the Bass (1985)'s Multifactor Leadership Questionnaire (MLQ), which was revised in a preliminary study by Park (1997). The Transformational Leadership Subscale and Transactional Leadership Subscale revised by Park (1997) were modified in this research, and the Cronbach's alphas of the two modified subscales were a little higher than those of Bass's original MLQ.

There were some differences in the construct validity between the modified Transformational Leadership Subscale used in this research and the Transformational Leadership Subscale of the original MLQ. Only two factors were found in the modified Transformational Leadership Subscale while three factors were presented in the original MLQ. The charisma items in the original MLQ loaded on one factor in this study as the original MLQ did. However, the items of two factors, individualized consideration and intellectual stimulation of the original MLQ loaded on only one factor in this research; thus, this factor was referred to as individualized consideration and stimulus.

There were also some differences in the construct validity between the modified Transactional Leadership Subscale used in this research and the Transactional Leadership Subscale of the original MLQ. This study identified three factors for transactional leadership, contingent reward, active management-by-exception, and passive management-by-exception which specified management. However, the Transactional Leadership Subscale of the original MLQ presented two factors, contingent reward and management-by-exception. These differences may have resulted from differences in the research samples. The original MLQ was measured with 70 male senior industrial

executives; whereas, the modified Transactional Leadership Subscale used in this research was measured with both senior and junior members. It is common that executives have broad, general, and comprehensive views of certain objectives while practitioners may have more circumscribed views. Thus, team members who are practicing under the management of team leaders may have more specific views on the management of their leaders. Overall, the modified Transformational and Transactional Leadership Subscales in this research were evaluated reliable and had support for their validities. However, it is necessary to re-test the modified subscales' reliability and validity in further research for those scales' ability to generalize.

The mean scores of transformation leadership and transactional leadership were 3.54 and 3.61, respectively. These scores were compared with those measured with staff nurses in hospital settings in previous studies and were found to be similar, although samples and research settings were different. In order to identify the difference of leadership mean scores between different healthcare professionals, the leadership scores of nurse teams (transformational: 3.45 and transactional: 3.58) were compared to those of social worker teams (transformational: 3.64 and transactional: 3.65) in this study and were not found to be significantly different. This may be interpreted that the leaders' leadership of healthcare professional teams was not significantly different with respect to other types of professionals or service settings. However, this interpretation should be carefully considered because leaders' leadership of various healthcare professional teams such as physicians, physical therapists, and nutritionists were not measured in diverse healthcare settings in this research; thus, further research to identify differences among

leaders' leadership of different healthcare professional teams in various healthcare settings is needed.

Collaboration Process

The collaboration process was constructed in the hypothesized model as having four domains, cohesiveness, level of conflicts, agreement of disciplinary logic, and agreement of interdisciplinary logic. However, one issue with the reliability of the Agreement of Disciplinary Logic Subscale appeared. The Cronbach's alpha of the Agreement of Disciplinary Logic Subscale was low (.49), which was much lower than that of Sicotte and his colleagues' (2002) study (.67). This may be explained in that the contents of some items to measure agreement of disciplinary logic were not appropriate for this study. For example, the item asking about the hierarchical status between a nurse team and a social worker team was not appropriate for this study because nurse teams and social worker teams work in different organizations although they collaborate in the same program (KHVS). However, this item was not a problem in the Sicotte and his colleagues' (2002) study (.67) because all of the different professionals belonged to the same organization in their research. Thus, agreement of disciplinary logic with a low reliability was dropped from further analyses and a more reliable instrument to measure agreement of disciplinary logic is needed for further research.

The mean scores of cohesiveness, level of conflicts, and agreement of interdisciplinary logic were 3.47, 2.12, and 3.43, respectively. Compared to Sicotte and his colleagues' (2002) study, the mean score of level of conflicts was obviously lower than 3.87. This was anticipated because it is common that a heterogeneous group has

more conflicts than a homogeneous group. The sample of this research was composed of only two disciplinary professionals, nurses and social workers; while in Sicotte and his colleagues' (2002) study, the sample consisted of nurses, physicians, physical therapists, occupational therapists, and psychologists.

Degree of Collaboration

The degree of collaboration was measured using the Intensity of Collaboration Scale of Sicotte and his colleagues (2002) and revised by the investigator. The reliability of the revised scale was .88 in this research, which was similar to Sicotte and his colleagues' (2002) study. The degree of collaboration presented two factors, care sharing activities and coordination of care services as was done in the Sicotte and his colleagues' (2002) study. However, the explanatory power of the factors for the degree of collaboration was higher than that of Sicotte and his colleagues' (2002) study. Thus, the revised scale may be more valid, but it is necessary to retest the revised scale in further research to assure the revised scale's validity.

The mean scores of the total degree of collaboration and two domains, care share activities and coordination of care services, in this research were lower than those reported by Sicotte and his colleagues (2002). This was not unexpected considering the differences in the collaboration history among the collaboration teams in the two studies. The collaboration model in the KHVS program has only been in existence for less than 10 years, while the collaboration programs in Sicotte and his colleagues' (2002) study were implemented 25 years ago. Generally, programs having a long history have shown better outcomes than those with a short history. Also, the distance between nurse teams

and social worker teams may affect the degree of collaboration. Unlike Sicotte and his colleagues' (2002) study where team members worked in a single center, nurse teams work in healthcare centers and social worker teams work in welfare centers; thus, they might have difficulty in effectively contacting and working together whenever they needed.

Research Hypotheses

This section discusses the two hypotheses proposed in the hypothesized model: 1) team member's characteristics and context variables have a significant direct effect on the collaboration process, and 2) team member's characteristics, context variables, and collaboration process variables have a significant direct effect on the degree of collaboration.

Hypothesis One

The first hypothesis that team member's characteristics and context variables have a significant direct effect on the collaboration process was rejected. However, some team member variables directly impacted the collaboration process. One variable of the collaboration process, *cohesiveness*, was positively influenced by belief in the benefits of collaboration. This finding was consistent with other studies where an individual's strong beliefs in the benefits of collaboration positively affected the collaborative process (Cohen & Bailey, 1997; Jeung, 2002; Klimoski & Mohammed, 1994; Sicotte et al., 2002; Weick & Roberts, 1993). In addition, cohesiveness was positively influenced by perception toward other professions' relationship. This finding elucidated more specifically how and what type of perception toward other professions impacted the

collaboration process than previous studies did. Previous studies have reported only correlations between general perceptions toward other professions and collaboration, which limited identifying how perception affected collaboration. Also, they did not specify perceptions toward other professions, so subjects' various perceptions toward other professions could not be identified. In light of the specified perception toward other professions, this research, therefore, may provide more detailed information about the impact that perception toward other professions has on collaboration.

Another variable of the collaboration process, *level of conflicts*, was influenced by duration as nurses or social workers and duration participating in the KHVS. Duration as nurses or social workers and duration participating in the KHVS were not predicted in the hypothesized model, but they showed a significant influence on the collaboration process. In this research, duration as nurses or social workers positively impacted level of conflicts. Perhaps over time, nurses and social workers became more entrenched in their own profession's intrinsic cultures which resulted in differing practice visions and principles and values for autonomy. Thus, professionals having a long duration as nurses and social workers might adhere to their own practice visions and principles and try to force them on other professions. This might cause conflicts between disciplinary team members, which, in turn, could impede the collaborative process (Allen, 1997; Mur-Veeman, Eijkelberg, & Spreeuwenberg, 2001; E. Thomas, Sexton, & Helmreich, 2003).

In contrast, a long duration participating in the KHVS negatively affected the level of conflicts. This finding was somewhat congruent with that of Temkin-Greener and colleagues' (2004) study in which the more years of collaboration experience, the more

likely the collaboration was considered to be effective. Although the duration participating in the KHVS did not impact all three variables of the collaboration process, it can be interpreted as a significant factor on the collaboration process because a more effective collaboration process was in opposition to the level of conflicts.

The other variable of the collaboration process, agreement of interdisciplinary logic that emphasizes sharing of care activities and decision-making power, was positively influenced by only one variable, perception toward other professions' ability. This result is highly plausible because healthcare professionals are more willing to share care activities and to make decisions together when other professions' abilities such as professional skills and knowledge and understanding of the program were considered excellent. Otherwise, when a professional's ability is poor, they are reluctant to share care activities and make decisions together.

No context variable influenced the collaboration process. This finding was congruent with findings from other studies in which context had a little effect on the collaboration process (Cohen & Bailey, 1997; Sicotte et al., 2002). Although the literature has shown little influence of context on the collaboration process, there is still one methodological issue that may have influence research findings. In this study, all of the context variables except transformational and transactional leaderships were composed of a small number of items, thus some important attributes of context may have been omitted.

Much literature has reported that leadership significantly influences the collaboration process (Bass, 1985; Hale, 2007; M. Lee, 1998). Based on the literature,

this research anticipated that transformational leadership encouraging dynamical interaction among team members would have a positive influence on the collaboration process, while transactional leadership stressing a standard performance rather than dynamical interaction among team members would have a negative influence on the collaboration process. However, no relationship between the leadership style and the collaboration process was found; thus additional research is needed to more clearly define and operationalize the concepts of transformational leadership and transactional leadership.

Hypothesis Two

The second hypothesis that team member's characteristics, context variables, and collaboration process variables have a significant direct effect on the degree of collaboration was rejected. However, some team member, context, and collaboration process variables directly impacted the degree of collaboration. Both of the degree of collaboration variables, care sharing activities and coordination of care services, were influenced by the same independent variables, beliefs in the benefits of collaboration, perception toward other profession's relationship, and agreement of interdisciplinary logic; while each collaboration process variable was influenced by different independent variable. Perhaps, this difference might be explained by comparing unique attributes of the collaboration process with those of the degree of collaboration. Much literature has described that the collaboration process is composed of dynamic and active interactions which are continuously affected by many factors to elicit desired outcomes (Jeung, 2002; Sicotte et al., 2002; Temkin-Greener et al., 2004). Thus, the result of this study that the

collaboration process had been influenced by various independent variables might show that the collaboration process between nurse teams and social worker teams was dynamic and active. In contrast, the degree of collaboration has been described as a result of the collaborative process in the literature; so it reflects a more stable condition of collaboration rather than an unpredictable one. In particular, this stability of the degree of collaboration might be a result of the continuous influence of a few regular factors rather than the irregular influences of many factors. Therefore, the research finding that both of the degree of collaboration variables were affected by the same variables is reasonable.

All variables of the degree of collaboration were positively influenced by beliefs in the benefits of collaboration, perception toward other profession's relationship, and agreement of interdisciplinary logic. The positive influence of beliefs in the benefits of collaboration on the degree of collaboration has been reported in previous studies where an individual's strong beliefs in the benefits of collaboration positively affected collaboration (Cohen & Bailey, 1997; Jeung, 2002; Klimoski & Mohammed, 1994; Sicotte et al., 2002; Weick & Roberts, 1993). Since the positive influence of beliefs in the benefits of collaboration was supported again in this research, healthcare providers and administrators in community settings may use this knowledge to improve their collaboration outcomes.

Perception toward other profession's relationship also showed a positive influence on all variables of the degree of collaboration. As mentioned previously in hypothesis one, this finding showed a more detailed impact of perception toward other professions on the degree of collaboration than other studies which have reported only correlations

between general perceptions toward other professions and collaboration. Two types of perception toward other professions were identified in this research, perception toward other professions' ability and perception toward other professions' relationship. However, only one, perception toward other professions' relationship, showed a significant influence on the degree of collaboration. This might indicate that teams participating in the KHVS considered relationships between nurse teams and social worker teams more important than each team's ability, including professional knowledge or skills, to elicit desired outcomes. However, research to examine whether this perception tendency is common in other healthcare disciplinary teams is necessary.

Agreement of interdisciplinary logic that emphasizes sharing of care activities and decision-making power positively impacted all variables of the degree of collaboration. This finding is consistent with other studies (Jehn, 1995; Jeung, 2002; Ko et al., 2002; Kwon, 2002; Sicotte et al., 2002; Temkin-Greener et al., 2004). In Sicotte and his colleagues' (2002) study, the degree of collaboration was also positively influenced by agreement of interdisciplinary logic. In addition, Sicotte and his colleagues' (2002) study showed the significant influence of other collaboration process variables (cohesiveness and level of conflicts) on the degree of collaboration. However, cohesiveness and level of conflicts did not have any significant influence on the degree of collaboration in this research. Although these two variables did not have any significant impact on the degree of collaboration, they were still considered to be meaningful variables for the degree of collaboration because this research presented significant correlations between cohesiveness and level of conflicts and the degree of collaboration. Cohesiveness

positively correlated with both care share activities ($r=.50$) and coordination ($r=.46$) while level of conflicts negatively correlated with care sharing activities ($r=-.23$). Thus, it is necessary to re-examine whether the variables of cohesiveness and level of conflicts can predict the degree of collaboration in future research.

Unlike the above three variables that impacted on both of the degree of collaboration variables, one of the communication mechanisms, regular meetings, impacted only on care sharing activities. This finding was congruent with much research where formalized communication mechanisms enhanced collaboration between service providers in healthcare settings (Henneman et al., 1995; Kraus, 1980; San Martin-Rodriguez et al., 2005). Besides formalized communication mechanisms, Sicotte and his colleagues (2002) also reported that administrative formalization, such as using formal forms among collaboration teams, enhanced the degree of collaboration. However, formal forms did not have any significant association with the degree of collaboration in this research although formal forms were the most frequently used as a communication mechanism between nurse teams and social worker teams. This is reasonable considering that face to face meetings were more effective than written forms to talk about clients and plan care services in detail for them. In conclusion, all the causal linkages proposed in the hypothesized model were not completely supported by the data. This study did, however, provide some significant theoretical linkages for collaboration between disciplinary teams in community settings as well as evidence for the linkages.

Study Implications and Limitations

This section provides suggestions for study refinement and practice and discusses limitations of the study in terms of methodology and those related to study findings.

Implications for Further Research and Practice

Results of this study suggest opportunities for future research despite some research limitations because the study provided preliminary knowledge of collaboration between disciplinary teams in community settings. Applying the SRO model, each of four constructs, team member, context, collaboration process, and degree of collaboration may influence each other. However, this research examined one-way influences of the constructs; thus, research to determine reciprocal influences of each construct variable is needed.

The roles of each leadership style needs to be explored. Transformational leadership, although supported in the literature and previous studies as a critical factor enhancing the collaboration process and the degree of collaboration, did not significantly influence them. In addition, transactional leadership, although supported in the literature and previous studies as a significant factor interfering with the collaboration process and the degree of collaboration, exhibited no significant influence on them. It is possible that these concepts were not fully defined and operationalized in this study. Therefore, additional research is needed to more clearly define and operationalize the concepts of transformational leadership and transactional leadership.

The lack of the influence of context variables on the collaboration process and the degree of collaboration is also a concern. This may be attributed to the use of a non-

standardized measurement that the investigator developed. Therefore, future research needs to re-examine the influence of context variables on the collaboration process and the degree of collaboration using reliable, valid, and standardized measurements.

The two collaboration process variables (cohesiveness and level of conflicts), although exhibiting strong evidence of reliability and validity and a significant correlation with the degree of collaboration, did not influence the degree of collaboration. There is a possibility that intervening variables or extraneous variables may interfere with the relationships between the collaboration process and the degree of collaboration. Thus, further research to identify those intervening variables or extraneous variables is needed.

This research also presents several implications for collaboration practice in providing high quality services to the elderly in community settings. First of all, this research identified significant factors that significantly impact the collaboration process and the degree of collaboration, so team members, leaders and administrators can get a better understanding of collaboration. In addition, the results of this study showed what collaboration process is important to improve the degree of collaboration for the elderly in community settings. Thus, healthcare providers can develop realistic and effective strategies to enhance care sharing activities and coordination of care services for the elderly in community settings, which would lead healthcare providers to not only assess the elderly holistically including physiological, psychological, and social aspects, but to also effectively plan and provide comprehensive care services to solve their complex problems. Therefore, the elderly would be able to maintain and improve their health and

well-being in community settings. Finally, this research can also provide a theoretical foundation for designing collaboration programs.

Study Limitations

The sample size of this research was a limitation. A ratio of five subjects to one of independent variable was considered appropriate for use in path analysis. While the initial number of independent variables was sixteen, but 21 independent variables appeared through factor analyses for each measurement. This resulted in a ratio of 3.8 to one of independent variable ($N=80$), so the ability to generalize the research findings may be limited, although the sample size of this study ($N=80$) was reasonable and acceptable in presenting statistical significance of the research findings. In addition, the research sample was a convenience sample drawn from 40 healthcare centers and 40 social welfare centers and excluded other healthcare providers such as physicians, physical therapists, and nutritionists. Therefore, a lack of random selection and diversity prevents generalization of study findings. Also, this study was conducted in Korean community settings, so it might be difficult to apply the study findings to hospital settings or to other nations' community settings.

Equivalence in numbers of team members on each team was also problematic since nurse teams were composed of, on average, seven nurses while social worker teams were composed of, on average, three social workers. Although it was anticipated that social worker teams consisted of a smaller number of members than nurse teams, the differences between the two disciplinary teams in the sample size hampered comparison of two disciplinary teams for collaboration. The other problem with the research sample

was the exclusion of clients from the collaboration team. Currently, clients are getting more active in obtaining care services, and healthcare providers essentially need clients' collaboration to improve the outcomes of their care services. Thus, the collaboration model proposed in this study should be expanded to include clients on collaboration teams.

A small number of context variables may be insufficient to investigate the impact of the context on collaboration. This study found a significant impact of only one context variable (regular meeting as a communication channel) on collaboration. However, there may be more organizational or social factors affecting collaboration between healthcare providers, thus the study findings may be difficult to generalize. As for the instruments, several items were deleted from some instruments to meet a criterion for inter-item correlation; however, this may have reduced the content validity and sensitivity of the instruments. Regarding research findings, a potential model and variable misspecification and/or measurement errors may have occurred with the proposed model. Refinement of middle range theories along with research would enhance the specification of significant model variables.

Summary

The purpose of this study was to test a hypothesized causal model of collaboration. Prior to testing the hypothesized model, the reliability and validity of each measurement for four constructs in the model were examined at both the individual level and team level for data aggregation; thus the research findings may be more reliable and

valid than previous studies that did not perform a psychometric examination of the measurements using aggregated data.

Two hypotheses were proposed in this research: 1) team member's characteristics and context variables have a significant direct effect on the collaboration process, and 2) team member's characteristics, context variables, and collaboration process variables have a significant direct effect on the degree of collaboration. The two hypotheses were rejected. This study did, however, provide some significant theoretical linkages for collaboration between disciplinary teams in community settings as well as evidence for the linkages.

Some implications for further research were also discussed. First, research to determine the reciprocal influence of each construct variable is needed. Second, the roles of each leadership style need to be explored because the findings of this research concerning leadership were inconsistent with other findings in the literature. Third, future research needs to be designed to examine the influence of context variables on the collaboration process and the degree of collaboration using reliable, valid, and standardized measurements. Finally, research to identify intervening variables or extraneous variables is needed.

This research also presented several implications for collaboration practice. Healthcare providers can develop realistic and effective strategies to enhance care sharing activities and coordination of care services for the elderly in community settings, which would lead healthcare providers to not only assess the elderly holistically, but to also effectively plan and provide comprehensive care services to solve their complex

problems. Therefore, the elderly would be able to maintain and improve their health and well-being in community settings. Finally, this research can also provide a theoretical foundation for designing collaboration programs.

There were some study limitations related to the methodology and study findings. Sample size and a convenient sampling, and a lack of random selection and diversity of the sample prevented generalization of study findings. A small number of context variables may have been insufficient to investigate the impact of context on collaboration, and potential model and variable misspecification and/or measurement errors may have occurred with the proposed model.

APPENDIX A

FLYER



Collaboration Between Disciplinary Teams Caring for Elders in Korean Community Settings

WHAT IS THE PURPOSE?

The purpose of the study is to test a hypothesized model of collaboration between disciplinary teams in the Korean Home Visiting Services (KHVS) where nurse teams and social worker teams collaborate to deliver quality comprehensive services to the elderly in Korean community settings.

WHO IS ELIGIBLE TO PARTICIPATE?

If you are a member of a nurse team or social worker team who have employed for at least 3 months in the Korean Home Visiting and ages 20 ~60 you are eligible to participate in this study.

WHAT ARE PARTICIPANTS ASKED TO DO?

If you agree to participate, your participation will involve completing a survey “Collaboration between Disciplinary Teams Caring for Elders in Community Settings” and it will take approximately half hour to complete the questionnaires.

SIGNIFICANCE OF THIS STUDY

This research will provide a more comprehensive understanding and realistic information of collaboration between disciplinary teams by identifying interactions between personal and environmental factors and outcomes. Furthermore, it will provide healthcare providers and administrators a theoretical foundation for designing collaboration programs.

COMPENSATION

You will be compensated with a small gift (a set of pens) as a token of appreciation.

FOR MORE INFORMATION CONTACT

Kyung Hee Lim

College of Nursing, University of Arizona

E-mail: klim@nursing.arizona.edu or kangsan91@hotmail.com

Phone: #1(nation code)-520-240-4742

APPENDIX B
SUBJECT DISCLAIMER FORM

SUBJECT DISCLAIMER FORM

Title of Project: Collaboration Between Disciplinary Teams Caring for Elders in Korean Community Settings

You are being invited to voluntarily participate in the above-titled research study. The purpose of the study is to test a hypothesized model of collaboration between disciplinary teams in the Korean Home Visiting Services (KHVS) where nurse teams and social worker teams collaborate to deliver quality comprehensive services to the elderly in Korean community settings. You are eligible to participate because you are member of a nurse team or a social worker team participating in the KHVS and ages 20~60 and have worked for the KHVS for at least 3 months.

If you agree to participate, your participation will involve completing the attached surveys. The surveys can be completed in a location convenient for you and will take approximately 30 minutes. You may choose not to answer some or all of the questions, and you may withdraw from the study at any time. Your name does not appear on the survey, and your confidentiality will be maintained in all reports of this project.

Any questions you have regarding the study will be answered and you may withdraw from the study at any time. There are no known risks nor direct benefit from your participation. There is no cost to you except for your time. You will be compensated with a small gift (a set of pens) for your participation.

Only the principal investigator will have access to the information you provide. In order to maintain your confidentiality, the information you provide will be coded with an identification number and your name and identity will not be revealed in any reports that result from this project. The questionnaire will be locked in a cabinet in a secure place.

You can obtain further information from the principal investigator (Kyung Hee Lim, Doctoral candidate at the University of Arizona) at klim@nursing.arizona.edu or #82(nation code)-053-591-2119. If you have questions concerning your rights as a research subject, you may call the University of Arizona Human Subjects Protection Program office at #1(nation code)-520-626-6721. Or, you can reach us with the toll free number at #1(nation code)-866-278-1455.

By completing the questionnaire, you are giving permission for the investigator to use your information for research purposes.

Thank you.

Kyung Hee Lim, RN, MS, PhD Candidate
College of Nursing, University of Arizona
Korean Version of Subject's Disclaimer

APPENDIX C
SURVEY INSTRUMENTS

Team Member Survey

Collaboration Between Disciplinary Teams Caring for Elders in Community Setting

Demographic Information

Please provide the following information. Remember confidentiality of the information will be maintained. Thank you for your participation!

1. What is your age? _____years
2. What is your gender? _____female _____male
3. What is your highest education level?

① High school _____	② Associate degree _____
③ Baccalaureate degree _____	④ Graduate degree _____
4. How long have you worked as a nurse (or social worker)?

_____years	_____months
------------	-------------

 *Specify months if <1 year
5. How long have you worked in the Korean Home Visiting Services?

_____years	_____months
------------	-------------

 *Specify months if <1 year
6. Have you ever participated in collaboration between disciplinary teams before?

_____yes	_____no
----------	---------

If yes, how was the experience?

Very negative		Very Positive
1	2 3 4	5

Instrument of Individual Ability

Please answer the following questions by circling the number from 1 to 5 that most accurately describes your opinion, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree.

1. I evaluate my own ability to provide special services requested by social worker (or nurse) teams as excellent.

Strongly disagree				Strongly agree
1	2	3	4	5

2. I evaluate my own ability to link to resources of social worker (or nurse) teams as excellent.

Strongly disagree				Strongly agree
1	2	3	4	5

Instrument of Perception Toward Other Professions

Below are 15 statements describing your opinion toward social workers or nurses whom you collaborate with. Please read each statement carefully and check the number from 1 to 5 that most accurately describes your opinion, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree.

Social Workers (or Nurses)	Strongly Disagree	2	3	4	Strongly Agree
1. Are competent	1	2	3	4	5
2. Have very little autonomy	1	2	3	4	5
3. Understand the capabilities of my profession	1	2	3	4	5
4. Are highly concerned with the client's health and welfare	1	2	3	4	5
5. Sometimes encroach on my professional territory	1	2	3	4	5
6. Are highly ethical	1	2	3	4	5

7. Expect too much of my profession	1	2	3	4	5
8. Have a higher status than my profession	1	2	3	4	5
9. Are very defensive about their professional prerogatives	1	2	3	4	5
10. Trust my professional advice	1	2	3	4	5
11. Seldom ask my professional advice	1	2	3	4	5
12. Fully utilize the capabilities of my profession	1	2	3	4	5
13. Do not cooperate well with my profession	1	2	3	4	5
14. Are well trained	1	2	3	4	5
15. Have good relations with my profession	1	2	3	4	5

Instrument of Multifactor Leadership Questionnaire

Below are 36 statements describing your opinion about leadership of your team leader. Please read each statement carefully and check the number from 1 to 5 that most accurately describes your opinion, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree.

Our Team Leader	Strongly Disagree				Strongly Agree
1. Provides us with assistance in exchange for our efforts.	1	2	3	4	5
2. Reexamines critical assumptions to question whether they are appropriate.	1	2	3	4	5
3. Fails to interfere until problems become serious.	1	2	3	4	5
4. Focuses attention on irregularities, mistakes, exceptions and deviations from standards.	1	2	3	4	5
5. Avoids getting involved when important issues arise	1	2	3	4	5
6. Talks about his/her most important values and beliefs.	1	2	3	4	5

Our Team Leader	Strongly Disagree					Strongly Agree
7. Is absent when needed.	1	2	3	4	5	
8. Seeks differing perspectives when solving problems.	1	2	3	4	5	
9. Talks optimistically about the future.	1	2	3	4	5	
10. Instills pride in being associated with him/her.	1	2	3	4	5	
11. Discusses in specific terms who is responsible for achieving performance targets.	1	2	3	4	5	
12. Waits to take action until things go wrong.	1	2	3	4	5	
13. Talks enthusiastically about what needs to be accomplished.	1	2	3	4	5	
14. Specifies the importance of having a strong sense of purpose.	1	2	3	4	5	
15. Spends time teaching and coaching.	1	2	3	4	5	
16. Makes clear what one can expect to receive when performance goals are achieved.	1	2	3	4	5	
17. Shows he/she is a firm believer in "if it isn't broke, don't fix it."	1	2	3	4	5	
18. Goes beyond his/her self-interest for the good of the group.	1	2	3	4	5	
19. Treats us as an individual rather than just as a member of a group.	1	2	3	4	5	
20. Demonstrates that problems must become chronic before he/she will take action.	1	2	3	4	5	
21. Acts in ways that builds our respect.	1	2	3	4	5	
22. Concentrated full attention on correcting unanticipated mistakes, complaints and failures.	1	2	3	4	5	
23. Considers the moral and ethical consequences of his/her decisions.	1	2	3	4	5	
24. Keeps track of all mistakes.	1	2	3	4	5	
25. Displays a sense of power and confidence.	1	2	3	4	5	

Our Team Leader	Strongly Disagree					Strongly Agree
26. Articulates a compelling vision of the future.	1	2	3	4	5	
27. Directs his/her attention toward failures to meet standards.	1	2	3	4	5	
28. Avoids making decisions.	1	2	3	4	5	
29. Considers us as an individual with different needs, abilities and aspirations from others.	1	2	3	4	5	
30. Gets us to look at problems from many different angles.	1	2	3	4	5	
31. Helps us to develop our strengths.	1	2	3	4	5	
32. Suggests new ways of looking at how to complete assignments.	1	2	3	4	5	
33. Delays responding to urgent questions.	1	2	3	4	5	
34. Emphasizes the importance of having a collective sense of mission.	1	2	3	4	5	
35. Express satisfaction when we meet expectations.	1	2	3	4	5	
36. Expresses confidence that goals will be achieved.	1	2	3	4	5	

Instrument of Beliefs in the Benefits of Interdisciplinary Collaboration

Please answer the following questions by circling the number from 1 to 5 that most accurately describes your opinion, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree.

Items	Strongly Disagree					Strongly Agree
1. A better answer to a client's bio-psycho-social needs is in collaborative work.	1	2	3	4	5	
2. Collaborative work results in greater client satisfaction.	1	2	3	4	5	
3. Collaborative work provides better support to us in interventions.	1	2	3	4	5	
4. Collaborative work improves the quality of care and services offered to clients.	1	2	3	4	5	
5. Collaborative work decreases duplicated services.	1	2	3	4	5	
6. Collaborative work fosters increased integration of interventions.	1	2	3	4	5	

Instrument of Interdisciplinary Collaboration Process

Please answer the following questions by circling the number from 1 to 5 that most accurately describes your opinion, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree.

Items	Strongly Disagree				Strongly Agree
1. Individual opinions are taken into account in important program decisions.	1	2	3	4	5
2. Professionals defend their colleagues in front of external critics.	1	2	3	4	5
3. There is high motivation to work with other disciplinary teams.	1	2	3	4	5
4. The success of one professional team is positively perceived by other professional teams.	1	2	3	4	5
5. The success of one professional group helps other groups attain their objectives.	1	2	3	4	5
6. There are strong ties between the professionals of different groups.	1	2	3	4	5
7. There is a high level of competition between different professional teams.	1	2	3	4	5
8. Interprofessional relationships are often perceived as necessarily having winners and losers (if one group wins, another loses).	1	2	3	4	5
9. There are frequent conflicts between different professional teams over sharing responsibilities.	1	2	3	4	5
10. The objectives of different professional teams are incompatible.	1	2	3	4	5
11. Disciplinary objectives conflict with the Korean Home Visiting Service program objectives.	1	2	3	4	5
12. Generally, conflicts between different professional teams over sharing responsibilities are easily resolved.	1	2	3	4	5

Items	Strongly Disagree					Strongly Agree
13. There is always some individual dissatisfaction with regard to group decisions.	1	2	3	4	5	
14. Disciplinary affiliation is harming multidisciplinary collaboration.	1	2	3	4	5	
15. Some professional teams define their responsibilities too narrowly.	1	2	3	4	5	
16. Hierarchical status between different professional teams exists.	1	2	3	4	5	
17. One professional team perceives other professional team to be at their service.	1	2	3	4	5	
18. A significant division exists between different professional teams in services.	1	2	3	4	5	
19. Different disciplines recognize the competence of others.	1	2	3	4	5	
20. Different disciplines recognize the importance of their mutual expertise.	1	2	3	4	5	
21. Mutual confidence between professional teams is high.	1	2	3	4	5	
22. The contributions of professionals in each discipline are equally valued.	1	2	3	4	5	

Instrument of Degree of Interdisciplinary Collaboration

Please answer the following questions by circling the number from 1 to 5 that most accurately describes your opinion, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree.

Items	Strongly Disagree					Strongly Agree
1. Each professional team is looking for professional support (advice, opinions) from other disciplinary teams.	1	2	3	4	5	
2. The level of collaboration between different professional teams is high.	1	2	3	4	5	
3. Each professional team exchanges information concerning patients with other disciplinary teams.	1	2	3	4	5	
4. Each professional team cooperates with other disciplinary teams to ensure patient follow-up.	1	2	3	4	5	
5. Each professional team collaborates with other disciplinary teams to develop a common care plan.	1	2	3	4	5	
6. Disciplinary intervention takes into account data collected by other disciplinary teams.	1	2	3	4	5	
7. Sharing of tasks is well established between different professional teams.	1	2	3	4	5	
8. Each professional team easily tolerates a gray area overlapping jurisdictions between different professional teams.	1	2	3	4	5	
9. Working relations between nurse and social worker teams are egalitarian rather than hierarchical.	1	2	3	4	5	
10. The whole client (i.e. physical, psychological and social dimensions) has been taken into account by all different professional teams.	1	2	3	4	5	
11. There is a high frequency of informal consultation between different professional teams.	1	2	3	4	5	
12. Professional collaboration between discipline team is harmonious.	1	2	3	4	5	
13. Team-based routines among the different professional teams are well defined.	1	2	3	4	5	

Items	Strongly Disagree					Strongly Agree
14. Sharing responsibilities is well established among the different professional teams.	1	2	3	4	5	
15. Each professional team provides their own care without interfering with each other.	1	2	3	4	5	
16. The several activities assumed by different professional teams concerning a particular client are well coordinated.	1	2	3	4	5	
17. Daily collaborative behaviors are inserted into day-to-day program functioning.	1	2	3	4	5	
18. Extensive effort is made to avoid conflicts concerning the sharing of tasks and responsibilities.	1	2	3	4	5	

Team Member Survey

Collaboration Between Disciplinary Teams Caring for Elders in Community Setting

Demographic Information

Please provide the following information. Remember confidentiality of the information will be maintained. Thank you for your participation!

1. What is your age? _____years
2. What is your gender? _____female _____male
3. What is your highest education level?

① High school _____	② Associate degree _____
③ Baccalaureate degree _____	④ Graduate degree _____
4. How long have you worked as a nurse (or social worker)?

_____years _____months
*Specify months if <1 year
5. How long have you worked in the Korean Home Visiting Services?

_____years _____months
*Specify months if <1 year
6. How long have you been a team leader in the Korean Home Visiting Services?

_____years _____months
*Specify months if <1 year
7. Have you ever participated in collaboration between disciplinary teams before?

_____yes _____no

If yes, how was the experience?

Very negative	Very Positive
1	5

Instruments of Organizational Structure

Please answer the following questions (Q1 and Q2) by circling the number from 1 to 5 that most accurately describes your opinion, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree.

1. Our team evaluates team workload for our own task (home visiting services) as heavy.

Strongly disagree				Strongly agree
1	2	3	4	5

2. Our team evaluates team workload for other tasks and chores that are not part of our work responsibility as heavy.

Strongly disagree				Strongly agree
1	2	3	4	5

3. Are there formalized communication mechanisms between your team and social worker teams (or nurse teams)?

_____yes _____no

If yes, what types of communication mechanisms exist?

_____Regular Meetings

_____Formal Referral Forms

_____Formal Follow-up Forms

_____Other

*(please specify _____)

Instrument of Team Resources

Please answer the following questions by circling the number from 1 to 5 that most accurately describes your opinion, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree.

1. Our team evaluates the financial support of our organization as sufficient.

Strongly disagree				Strongly agree
1	2	3	4	5

2. Our team evaluates the manpower support of our organization as sufficient.

Strongly disagree				Strongly agree
1	2	3	4	5

3. Our team does not have any difficulty in finding appropriate welfare centers (or healthcare centers) with whom to collaborate.

Strongly disagree				Strongly agree
1	2	3	4	5

REFERENCES

- Abbott, A. (1988). *The system of professions: An essay on the division of expert labour*. Chicago: University of Chicago Press.
- Abramson, J. S., & Mizrahi, T. (1996). When social workers and physicians collaborate: Positive and negative interdisciplinary experiences. *Social Work, 41*, 270-281.
- Aday, L. A. (1993). *At Risk in America: The Health and Health Care Needs of Vulnerable Populations in the United States*. San Francisco: Jossey-Bass.
- Aiken, L. H., Sochalski, J., & Lake, E. T. (1997). Studying outcomes of organizational change in health services. *Medical Care, 35*(11 Suppl), NS6-18.
- Allen, D. (1997). The nursing medicine boundary: negotiated order. *Sociology of Health and Illness, 19*(4), 498-520.
- Alter, C., & Hage, J. (1993). *Organization working together*. Newbury Park, CA: Sage.
- Arcangelo, V. P. (1994). The myth of independent practice. *Nursing Forum, 29*, 3-4.
- Baggs, J. G., & Ryan, S. A. (1990). ICU nurse-physician collaboration and nursing satisfaction. *Nursing Economics, 8*, 386-392.
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York: The Free Press.
- Bertalanffy, L. V. (1968). *General system theory; foundations, development, applications*. New York: Braziller.
- Bozzini, L. (1988). Local Community Service Centers in Qubec: Description, evaluation, perspectives. *Journal of Public Health Policy, 9*(3), 346-375.
- Brewer, B. B. (2002). Overview. Expanding horizons in nursing systems research: The SRO model [Abstract]. *Proceedings of the Communicating Nursing Research Conference and WIN Assembly; Vol. 35. Health disparities: Meeting the challenge*(p.118). Portland, OR: Western Institute of Nursing.
- Brewer, B. B., Greenberg, M. E., McEwen, M. M., Doyle, M. D., Lamb, G., Effken, J. A., & Verran J. A. (2002). *The Systems Research Organizing Model (SROM)*. Unpublished manuscript, The University of Arizona at Tucson.
- Bronstein, L. R. (2002). Index of interdisciplinary collaboration. *Social Work Research, 26*, 113-126.

- Bronstein, L. R. (2003). A model for interdisciplinary collaboration. *Social Work, 48*(3), 297-306.
- Brown, G. F. C. (1995). *Factors that facilitate or inhibit interdisciplinary collaboration within a professional bureaucracy*. University of Arkansas.
- Burns, J. M. (1978). *Leadership*. New York: Harper & Row.
- Bury, M. R. (1982). Chronic illness as biographical disruption. *Sociology of Health and Illness, 4*, 167-182.
- Cerne, F. (1993). Joining forces: Maine hospitals find that cooperation brings results. *Hospitals, 67*, 26-27.
- Chappell, N. L., & Badger, M. (1989). Social isolation and well-being. *Journal of Gerontology, 44*, S169-S176.
- Charmaz, K. (1983). Loss of self: A fundamental form of suffering in the chronically ill. *Sociology of Health and Illness, 5*, 168-195.
- Choi, H. (1996). *A study on the chronic illness morbidity and utilization of medical facilities of the elderly in urban and rural areas*. Master thesis, Chungnam National University.
- Choi, J. (2003). *The characteristics of the nursing organizational culture and organizational effectiveness*. Ph.D. Dissertation, Korea University.
- Cohen, S. G., & Bailey, D. G. (1997). What makes teams work: group effectiveness research from the shop floor to the executive suite. *Journal of Management, 23*(3), 239-290.
- Coluccio, M., & Maguire, P. (1983). Collaborative practice: becoming a reality through primary nursing. *Nursing Administration Quarterly, 7*, 59-63.
- D'Amour, D., Ferrada-Videla, M., San Martin Rodriguez, L., & Beaulieu, M. D. (2005). The conceptual basis for interprofessional collaboration: core concepts and theoretical frameworks. *Journal of Interprofessional Care, 19*(Suppl 1), 116-131.
- D'Amour, D., Goulet, L., Pineault, R., Labadie, J. F., & Remondin, M. (2004). *Comparative study of inter-organizational collaboration and its effects in four Quebec socio-sanitary regions: the case of prenatal care*. Montreal: University of Montreal.
- D'Amour, D., Sicotte, C., & Levy, R. (1999). The collective action within interprofessional equips in the health services. *Social sciences and health, 17*, 68-94.

- Dechairo-Marino, A. E., Jordan-Marsh, M., Traiger, G., & Saulo, M. (2001). Nurse/physician collaboration: action research and the lessons learned. *Journal of Nursing Administration, 31*(5), 223-232.
- Donabedian, A. (1966). Evaluating the quality of medical care. *Milbank Memorial Fund Quarterly, 44*(2), 166-206.
- Doyle, M., & Effken, J. (2002). Expanding horizons in nursing systems research: The SRO model [Abstract]. *Proceedings of the Communicating Nursing Research Conference and WIN Assembly; Vol. 35. Health disparities: Meeting the challenge*. Portland, OR: Western Institute of Nursing.
- Doyle, M., & McEwen, M. (2002). The systems research organizing (SRO) model [Abstract]. *Proceedings of the Communicating Nursing Research Conference and WIN Assembly; Vol. 35. Health disparities: Meeting the challenge*(p.119). Portland, OR: Western Institute of Nursing.
- Ducanis, A. J., & Golin, A. K. (1979). *The interdisciplinary health care team; A handbook*. Germantown: Aspen Systems Corporation.
- Ebersole, P., Hess, P., & Luggen, A. S. (2004). *Toward healthy aging*. St. Louis: Mosby.
- Effken, J. A., Brewer, B. B., Patil, A., Lamb, G. S., Verran, J. A., & Carley, K. (2005). Using OrgAhead, a computational modeling program, to improve patient care unit safety and quality outcomes. *International Journal of Medical Informatics., 74*(7-8), 605-613.
- Effken, J. A., Brewer, B. B., Patil, A., Lamb, G. S., Verran, J. A., & Carley, K. M. (2003). Using computational modeling to transform nursing data into actionable information. *Journal of Biomedical Informatics, 36*(4-5), 351-361.
- Eliopoulos, C. (2001). *Gerontological Nursing*. Philadelphia: Lippincott.
- Evans, J. A. (1994). The role of the nurse manager in creating an environment for collaborative practice. *Holistic Nursing Practice, 8*(3), 22-31.
- Fried, B., Topping, S., & Rundall, T. G. (2000). *Groups and teams in health services organizations* (4th ed.). Albany, NY: Delmar.
- Gage, M. (1998). From independence to interdependence. Creating synergistic healthcare teams. *Journal of Nursing Administration, 28*(4), 17-26.
- Gitterman, A. (1991). *Handbook of Social Work Practice with Vulnerable Populations*. New York: Columbia University Press.

- Golin, A. K., & Ducanis, A. J. (1981). *The interdisciplinary team. A handbook for the education of exceptional children*. Germantown: Aspen Systems Corporation.
- Gorsuch, R. L. (1983). *Factor analysis* (2nd ed. ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Hackman, J. R., & Walton, R. E. (1986). *Leading groups in organizations*. San Francisco: Jossey-Bass.
- Hale, B. A. (2007). *Hospice interdisciplinary team processes and effectiveness*. The University of Arizona at Tucson.
- Harkins, S. W., Kwentus, J., & Price, D. (1984). *Pain and the elderly*. New York: Raven.
- Haward, R., Amir, Z., Borrill, C., Dawson, J., Scully, J., West, M., et al. (2003). Breast cancer teams: the impact of constitution, new cancer workload, and methods of operation on their effectiveness. *British Journal of Cancer*, 89(1), 15-22.
- Hayward, L. M., DeMarco, R., & Lynch, M. M. (2000). Interprofessional collaborative alliances: Health care educators sharing and learning from each other. *Journal of Allied Health*, 29, 220-226.
- Heinemann, G. D., & M., Z. A. (2002). *A model of team performance*. New York: Kluwer Academic/Plenum Publishers.
- Henneman, E. A., Lee, J. L., & Cohen, J. I. (1995). Collaboration: a concept analysis.[see comment]. *Journal of Advanced Nursing*, 21(1), 103-109.
- Henry, V., Schmitz, K., Reif, L., & Rudie, P. (1992). Collaboration: integrating practice and research in public health nursing. *Public Health Nursing*, 9(4), 218-222.
- Hills, M. D., Lindsey, E., Chisamore, M., Bassett-Smith, J., Abbott, K., & Fournier-Chalmers, J. (1994). University-college collaboration: Rethinking curriculum development in nursing education. *Journal of Nursing Education*, 33, 220-225.
- Hodges, H. F., Keeley, A. C., & Grier, E. C. (2001). Masterworks of art and chronic illness experiences in the elderly. *Journal of Advanced Nursing*, 36(3), 389-398.
- Hord, S. M. (1986). A synthesis of research on organizational collaboration. *Educational Leadership*, 43(5), 22-26.
- Huber, D. L., Maas, M., McCloskey, J., Scherb, C. A., Goode, C. J., & Watson, C. (2000). Evaluating nursing administration instruments. *Journal of Nursing Administration*, 30, 252-272.

- HwangBo, S. J., & Kim, H. R. (2003). Prevalence of chronic disease and visiting nurse services according to disease for low income urban elders using the health center. *Journal of Korean gerontological nursing*, 5(2), 228-239.
- Jaffe, D. (2001). *Organization theory: Tension and change*. NY: McGraw Hill.
- Jehn, A. (1995). A multi-method examination of the benefits and determinants of intragroup conflict. *Administrative Science Quarterly*, 40(2), 245-282.
- Jeung, S. (2002). *A Study on the Community-based Linkage of Health and Welfare Services in Bucheon City*. Mater thesis, Catholic University.
- Johnson, N. D. (1992). Collaboration--an environment for optimal outcome. *Critical Care Nursing Quarterly*, 15(3), 37-43.
- Kagan, S., Goffin, S., Golub, S., & Pritchard, E. (1995). *Toward systemic reforms: Service integration for young children and their families*. Des Moines, IA: National Center for Service Integration.
- Kahn, R., & Antonucci, T. (1981). *Convoys of social support: a life course approach*. New York: Academic Press.
- Kane, R., & Ouslander, J. (1989). *Essentials of Clinical Geriatrics*. New York: McGraw-Hill.
- Kim, H. (2000). *Report about plans on elderly welfare policies in aging society*. Seoul: The National Assembly of the Republic of Korea.
- King, M. B. (1990). Clinical nurse specialist collaboration with physicians. *Clinical Nurse Specialist*, 4(4), 172-177.
- Klimoski, R., & Mohammed, S. (1994). Team mental model: construct of metaphor. *Journal of Management*, 20(2), 403-437.
- Knudtsen, J. A. (1994). Nurse practioners in primary care. *New England Journal of Medicine*, 330, 1537-1540.
- Ko, I., Kim, C., Lee, T., Lee, K., Kim, E., Ma, H., et al.(2002). Evaluation of Government Assisted Visiting Nursing Services of Health Center in 2000. *Journal of Korean academic nursing*, 32(3), 344-354.
- Korea Statistical Office. (2003). *Population Projections*. Retrieved March 30, 2007, from <http://www.nso.go.kr>.

- Kraus, W. A. (1980). *Collaboration in organization: Alternative to hierarchy*. New York: Human science press.
- Kwon, Y. (2002). *A study on the alternatives for the activation of the visiting nursing works of local public health centers and the social welfare linkage*. Mater thesis, Kyung Hee University.
- Lawrence, P., & Lorsch, J. (1967). *Organizational and environment: managing differentiation and integration*. Homewood, IL: Richard D. Irwin.
- Lee, K. (2003). *Need Assessment in Home Health Nursing Care for Clients of Visiting Nursing Services*. Master thesis, Yonsei University.
- Lee, M. (1998). *A study on leadership type of immediate senior office and effectiveness of nursing system*. Master thesis, Kyung Hee University.
- Lee, M. (1999). *A study on leadership type of immediate senior officer and effectiveness of nursing system*. Master thesis, Kyung Hee University.
- Lee, P., Kim, S., Kim, S., Lee, S., Park, E., Park, Y., et al. (2002). Nursing need of patients with chronic illness: A primary study for development for the nursing center of chronic illness. *Korean Nursing Journal*, 32(2), 165-175.
- Lee, T. (2004). Economic evaluation of visiting nurses services for the low-income elderly with long-term care needs. *Journal of Korean academic nursing*, 34(1), 191-201.
- Lee, Y. (1996). *An empirical study on the effect of transactional leadership and transformational leadership on the leadership effectiveness*. PhD. dissertation, Pusan National University.
- Mariano, C. (1989). The case for interdisciplinary collaboration. *Nursing Outlook*, 37(6), 285-288.
- Mark, B. A., Sayler, J., & Smith, C. S. (1996). A theoretical model for nursing systems outcomes research. *Nursing Administration Quality*, 20(4), 12-27.
- Mattessich, P., & Monsey, B. (1992). *Collaboration: What makes it work* (5th ed.). St. Paul, MN: Amherst H. Wilder Foundation.
- McEwen, M., & Lamb, G. (2002). The SRO model: A framework for community-based research [Abstract]. *Proceedings of the Communicating Nursing Research Conference and WIN Assembly; Vol. 35. Health disparities: Meeting the challenge*. Portland, OR: Western Institute of Nursing.

- Miccolo, M. A., & Spanier, A. H. (1993). Critical care management in the 1990s: Making collaborative practice work. *Critical Care Clinics*, 9, 443-453.
- Mills, M. E. (1990). The CNSs and collaborative practice. *Clinical Nurse Specialist*, 4(4), 194-195.
- Mitchell, P., Ferketich, S., & Jennings, B. M. (1998). Quality health outcomes model. American Academy of Nursing Expert Panel on Quality Health Care. *Image Journal of Nursing Scholarship*, 30(1), 43-46.
- Mukamel, D. B., Temkin-Greener, H., Delavan, R., Peterson, D. R., Gross, D., Kunitz, S., et al. (2006). Team Performance and Risk-Adjusted Health Outcomes in the Program of All-Inclusive Care for the Elderly (PACE). *Gerontologist*, 46, 227-237.
- Mundinger, M. O. (1994). Advanced practice nurse-good medicine for physician? *Nursing Forum*, 330, 211-213.
- Munro, B. H. (2001). *Statistical methods for health care research*. Philadelphia, PA: Lippincott Williams & Wilkins.
- Mur-Veeman, I., Eijkelberg, I., & Spreeuwenberg, C. (2001). How to manage the implementation of shared care: a discussion of the role of power, culture and structure in the development of shared care arrangements. *Journal of Management in Medicine*, 15(2), 142-155.
- Nichols, L., DeFries, A. M., & Malone, C. C. (2002). *Team process*. New York: Kluwer Academic/Plenum Publishers.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed. ed.). New York: McGraw-Hill, Inc.
- Osborn, R., Simmons Tropea, D., & Schwenger, C. (1986). *Health Status and health Services for Elderly Canadians: Research Paper #5*. Toronto: University of Toronto.
- Park, H. (1997). *Transformational and transactional leadership styles of the nurse administrators and job satisfaction, organizational commitment in nursing service*. Master thesis, Ewha Womans University.
- Parsons, M. L. (1999). Health promoting organizations: a systems model for advanced practice. *Holistic Nursing Practice*, 13(4), 80-89.
- Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed. ed.). Orlando, FL: Harcourt, Inc.

- Pike, A. W., McHugh, M., Canney, K. C., Miller, N. E., Reiley, P., & Seibert, C. P. (1993). A new architecture for quality assurance: nurse-physician collaboration. *Journal of Nursing Care Quality*, 7(3), 1-8.
- Powell, J. L. (2001). *The NHS and Community Care Act (1990) in the United Kingdom: A Critical Review*. Liverpool: Liverpool John Moores University.
- Provan, K. G., & Milward, H. B. (2001). Do networks really work? A framework for evaluating public sector organizational networks. *Public Administration Review*, 61, 414-423.
- Provan, K. G., Milward, H. B., & Isett, K. R. (2002). Collaboration and integration of community-based health and human services in a nonprofit managed care system. *Health Care Management Review*, 27(1), 21-32.
- Putnam, M. (2002). Linking aging theory and disability models: increasing the potential to explore aging with physical impairment. *Gerontologist*, 42(6), 799-806.
- Reese, D. J., & Sontag, M. A. (2001). Successful interprofessional collaboration on the hospice team. *Health & Social Work*, 26(3), 167-175.
- Rhee, J., Chung, E., Ham, C., & Lee, Y. (2006). The linkage of health care and social services for the elderly in Jeonnam Province and its related factors. *Korean Journal of Health Policy & Administration*, 16(1), 41-53.
- Robichaud, T. G. (2004). *An innovative project to transform the acquisition and distribution of inventory supply in an effort to lower procurement costs*. Mater thesis. The University of Arizona at Tucson.
- Roh, Y. (2000). *A study on the linkage and partition of social work and health care professional roles for the aged in the agriculture area home care setting: the case of Changsung, Chollanamdo*. Mater thesis, Honam University.
- Ross, M. M., & Crook, J. (1998). Elderly recipients of home nursing services: pain, disability and functional competence. *Journal of Advanced Nursing*, 27(6), 1117-1126.
- Ryu, H., & Hwang, R. (2004). A study on the status and policy issues of visiting nursing programs at public health centers in urban areas. *The Journal of Korean Community Nursing*, 15(1), 67-75.
- San Martin-Rodriguez, L., Beaulieu, M. D., D'Amour, D., & Ferrada-Videla, M. (2005). The determinants of successful collaboration: a review of theoretical and empirical studies. *Journal of Interprofessional Care*, 19 Suppl 1, 132-147.

- Saewert, K. J. (2003). *Testing a Systems Research Organizing Model for Behavioral Health*. PhD. dissertation. The University of Arizona at Tucson.
- Satariano, W. A. (2006). *Epidemiology of aging*. Boston: Jones and Bartlett Publishers.
- Seo, B. (2002). *A study on a linkaged model of a visiting service for the aged in home*. Mater thesis. Mokwon University
- Shim, M. (2005). *A study on the correlation among transformational and transactional leadership of head nurse, job satisfaction, organizational commitment, and job performance of nurse*. Master thesis. Kwandong University.
- Sicotte, C., D'Amour, D., & Moreault, M. P. (2002). Interdisciplinary collaboration within Quebec Community Health Care Centres. *Social Science & Medicine*, 55(6), 991-1003.
- Solar, M., & Shauffer, C. (1993). Fighting fragmentation: Coordination of services for children and families. *Education and Urban Society*, 25, 129-140.
- Stichler, J. F. (1995). Professional interdependence: the art of collaboration. *Advanced Practice Nursing Quarterly*, 1(1), 53-61.
- Stordeur, S., Vandenberghe, C., & D'hoore, W. (2000). Leadership styles across hierarchical levels in nursing departments. *Nursing Research*, 49(1), 37-43.
- Sullivan, T. (1998). *Collaboration: A health care imperative*. New York: McGraw Hill.
- Temkin-Greener, H., Gross, D., Kunitz, S. J., & Mukamel, D. (2004). Measuring interdisciplinary team performance in a long-term care setting. *Medical Care*, 42(5), 472-481.
- Thomas, E., Sexton, J., & Helmreich, R. (2003). Discrepant attitudes about teamwork among critical care nurses and physicians. *Critical Care Medicine*, 31(3), 956-959.
- Thomas, L. E., & Chambers, K. (1989). Phenomenology of life satisfaction among elderly men: quantitative and qualitative views. *Psychology and Aging*, 4, 284-289.
- Tourangeau, A., E., & McGilton, K. (2004). Measuring Leadership Practices of Nurses Using the Leadership Practices Inventory. *Nursing Research*, 53(3), 182-189.
- United States Department of Health and Human Services (2001). *A profile of older Americans: 2001*. Washiton

- Verbrugge, L. M., & Jette, A. M. (1994). The disablement process. *Social Science & Medicine*, 38(1), 1-14.
- Verran, J. (2003). *Value of the Systems Research Organizing Model*. Unpublished manuscript, The University of Arizona at Tucson.
- Verran, J., Gerber, R. M., & Milton, D. A. (1995). Data aggregation : Criteria for psychometric evaluation. *Research in Nursing and Health*, 18, 77-80.
- Verran, J., Mark, B., & Lamb, G. (1992). Psychometric examination of instruments using aggregated data. *Research in Nursing & Health*, 15, 237-240.
- Walker, L. O., & Avant, K. C. (1995). *Strategies for the theory construction in nursing*. East Norwalk. New York: Appleton-Century-Crofts/Prentice Hall.
- Warren, M. L., Houston, S., & Luquire, R. (1998). Collaborative practice teams: from multidisciplinary to interdisciplinary. *Outcomes Management for Nursing Practice*, 2(3), 95-98.
- Weick, K. E., & Roberts, K. H. (1993). Collective mind in organizations. *Administrative Science Quarterly*, 38, 357-381.
- Wells, N., Johnson, R., & Salyer, S. (1998). Interdisciplinary collaboration. *Clinical Nurse Specialist*, 12(4), 161-168.
- West, M. A., Borril, C. S., & Unsworth, K. L. (1998). Team effectiveness in organizations. *International Review of Industrial and Organizational Psychology*, 13(1-48).
- WHO. (1997). *World health report 1997*. New York: World Health Organization.
- Yeatts, D. E., & Hyten, C. (1998). *Contemporary theories explaining self-managed work team performance*. Beverley Hills: Sage Publication.
- Yoo, I. (2003). A study on link of health and welfare service and barrier's factors of visiting nurses and social welfare workers. *Journal of Korean Academic Nursing*, 33(1), 113-121.