2000

Alcohol and tobacco use in Japan among adolescents with chronic kidney disease.

Mitsue Maru
University of Alabama at Birmingham

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA

UMI®
800-521-0600

ALCOHOL AND TOBACCO USE IN JAPAN AMONG ADOLESCENTS WITH CHRONIC KIDNEY DISEASE

by

MITSUE MARU

A DISSERTATION

Submitted to the graduate faculty of the University of Alabama at Birmingham
in the partial fulfillment of requirements for the degree of
Doctor of Science in Nursing

BIRMINGHAM, ALABAMA

1999

ABSTRACT OF DISSERTATION
GRADUATE SCHOOL, UNIVERSITY OF ALABAMA AT BIRMINGHAM

Degree DSN Program Maternal and Child Nursing

Name of Candidate Mitsue Maru

Committee Chair Carol Dashiff

Title Alcohol and Tobacco Use In Japan Among Adolescents With Chronic Kidney Disease

Many types of pediatric chronic kidney disease have the potential to carry over into adulthood age. Because of the high risk of carry over and limitation in opportunities for kidney transplants, adolescents with chronic kidney disease need to develop a healthy lifestyle and avoid unhealthy lifestyle choices such as alcohol and tobacco use. A modification of Jessor's (1991) problem behavior theory was used in this study. The purposes of this study were to: (a) describe the prevalence of alcohol and tobacco use of Japanese adolescents with chronic kidney disease, (b) ascertain relationships between risk behavior and selected independent variables from the perceived environment system, personality system, behavior system, illness-related characteristics, and demographics, and (c) examine how much variability in alcohol and tobacco use could be explained by selected variables from the five domains. A set of questionnaires was administered to 80 adolescents from three different clinics located in eastern Japan. Descriptive statistics showed that about one third ($n = 25$, 31.2%) were defined as drinkers or problem drinkers according to the Quantity-Frequency scale developed by Suzuki et al. (1994). Twelve adolescents (15%) used tobacco. Four variables (father's use of alcohol, father's use of tobacco, club activity noninvolvement, and nonadherence) accounted for 30.2% of the variance in alcohol use. The low prevalence of alcohol and tobacco use compared with

previous nationwide studies might be related to the presence of illness. Spearman's correlation coefficient showed that adolescents' use of alcohol was correlated with use of tobacco ($R = .35$, $P < .01$). Alcohol use was also associated with nonadherence ($R = .39$, $P < .001$). Adolescents whose fathers used alcohol and tobacco, who did not participate in the prescribed regimen, and who visited the clinic less frequently were more likely to engage in alcohol use. The findings of this study suggested that unhealthy lifestyle choices by parents, especially the father's use of alcohol and tobacco, had an influence on adolescents' use of alcohol. Difficulty adhering to restrictions of daily life also accompanied alcohol use. Gender was the only predictor among the independent variables, and it accounted for 7.8% of the variance of tobacco use because of the limited number of tobacco users.

DEDICATION

This manuscript is dedicated to my husband, Yasushi, whose love and understanding persists throughout this endeavor, and to my parents, Hideji and Masako Nakashima, who have encouraged me since I decided to study in the United States.

ACKNOWLEDGEMENTS

I wish to extend my sincere appreciation and deepest gratitude to my chair, Dr. Carol Dashiff. Her expert advice, careful considerations, detailed reading, and comments helped me to complete this dissertation. Members of my committee, Drs. Kathleen Brown, Anne Turner-Henson, Jan Wallander, and Malcolm Turner, through understanding and excellent teaching, encouraged me to continue this study. I am especially appreciative of the physicians, adolescents, and parents whose interest and endorsement made this study possible.

I would like to acknowledge the support given by Chiba University School of Nursing, especially for Professor Hisako Komiya and many colleagues at Chiba University School of Nursing, for making pursuit of my educational interests possible. I would like to extend my special appreciation to Professor Yuriko Kanematsu, the Dean of School of Nursing at Iwate Prefectural University and the former head of the department of Child Nursing at Chiba University School of Nursing. This achievement would not be possible without the guidance, understanding, and encouragement she has given to me since I was an undergraduate student.

I am grateful to my husband, Yasushi Maru, whose love and patience continued throughout this process and to my parents, Hideji and Masako Nakashima, who always supported me and taught me to believe in my ability.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Current statistics show that at least 121,000 children and adolescents in Japan have chronic pediatric diseases (Children and Family Bureau, Japanese Ministry of Health and Welfare, 1996). The number of chronically ill children and adolescents has increased 60% since 1982 because advances in medical treatment and allied health services result in longer survival (Maeda, 1996). As the life expectancy of chronically ill adolescents has increased dramatically, the lifetime cost of medical treatments has risen (Maeda).

Health promotion strategies for chronically ill adolescents are needed to reduce their risk of acquiring secondary health problems in adulthood (Maeda, 1996)). Chronic pediatric kidney disease accounts for about 15% of all chronic illness of children and adolescents in Japan, and many types of pediatric kidney disease have the potential to carry over into adulthood (Igarashi, 1996).

Alcohol and tobacco use can exacerbate chronic conditions. It is known that, over short periods of time, chronic respiratory diseases such as asthma can be exacerbated by tobacco use (LeSon & Gershwin, 1995) and that blood sugar control in diabetes can be worsened by alcohol use (Meeking & Cavan, 1997; Vanelli et al., 1997). Adolescents with such chronic illness may be aware of the harm incurred by alcohol and tobacco use because their conditions are immediately affected. Chronically ill adolescents whose

disease conditions are not directly affected by alcohol and tobacco use may likely be at risk for worsening their condition because they do not experience rapid changes in their conditions after using alcohol, tobacco, or both. Therefore, the latter group of adolescents, who suffer from conditions such as chronic nephritis, may drink or smoke more frequently than adolescents with asthma or diabetes. As a result, long-term alcohol and tobacco use will be a greater threat to the health of adolescents with chronic kidney disease than chronically ill adolescents whose condition will be rapidly changed by alcohol and tobacco use.

Statement of the Problem

The use of alcohol and tobacco by adolescents is a growing concern in Japan. In the 1990s, alcohol misuse by adolescents was ten times higher than that in the 1980s (Suzuki, 1995). Compared with the nationwide study of tobacco use in adolescents in 1989, the smoking rate in 1997 was higher (Kawabata, Shimai, & Nishioka, 1998). Because adolescence is a crucial period for establishing lifelong habits, the early engagement in risk behaviors can be a lifelong threat to health (Jessor, 1991). Chronically ill adolescents are at greater risk than healthy peers for physical, psychological, and social problems resulting from behaviors that risk their health (Hollen & Hobbie, 1996). Such problems were often reported in studies related to children and adolescents with chronic kidney disease (N. Nakamura et al., 1996; Nakamura et al., 1997; Yamazaki & Amano, 1993). Because many secondary health problems of adolescents are associated with styles and habits of life, these are potentially preventable (Millstein, Petersen, & Nightingale, 1993). However, studies related to chronically ill adolescents' risk behaviors

have been focused on nonadherence to the treatment regimen (Hanna, 1993). Few studies about the risk behaviors of chronically ill adolescents have been conducted. In addition, studies related to alcohol and tobacco use in healthy Japanese adolescents have mainly investigated the prevalence of their use, or they have only examined the relationships between risk behavior and a single variable chosen from many possible contributors of adolescents' risk behavior (Ichimura et al., 1992; Ichimura, Minagawa, Watanabe, Nozu, & Okada, 1995; Ikegami, Saito, Yamada, Arakubo, & Kouno 1983; Kawabata et al., 1991a, Kawabata et al., 1998; Matsushita et al., 1996; Ohtsu, 1989; Osaki & Minowa, 1996). Therefore, little is known about the determinants of risk behaviors by adolescents with chronic illness.

In Japanese clinical situations, doctors and nurses tend to overlook alcohol and tobacco use. Even if they are aware of substance use by chronically ill adolescents, the health care professionals are reluctant to intervene in those problems. To provide developmentally appropriate care concerning prevalence of risk behaviors of adolescents, health care providers need knowledge of determinants of the risk behaviors of chronically ill adolescents. The findings of this study will provide insights into alcohol and tobacco use by adolescents with chronic kidney disease. Furthermore, it will encourage the creation of strategies for risk reduction and health promotion in adolescents with chronic kidney disease.

Purpose of the Study

Alcohol and tobacco use among healthy adolescents have been widely surveyed for the last two decades. However, there has been little examination of factors related to

alcohol and tobacco use by chronically ill adolescents. Because many psychosocial risk factors that may lead to alcohol and tobacco use were reported among adolescents with chronic kidney disease, these adolescents needed to be studied. The first purpose of this study was to describe the prevalence of alcohol and tobacco use of Japanese adolescents with chronic kidney disease. Alcohol and tobacco consumption will not have short-term or immediate effects on the health condition of those adolescents. Adolescents with this type of chronic illness face a greater chance of developing unhealthy lifestyles compared with adolescents with chronic illness whose conditions are easily changed by alcohol and tobacco use. The second purpose was to ascertain relationships between risk behaviors and selected independent variables such as perceived environment system, personality system, behavior system, illness-related characteristics, and demographic characteristics. The third purpose was to examine how much variability in alcohol and tobacco use could be explained by selected variables from the perceived environment system, personality system, behavior system, illness-related characteristics, and demographic characteristics.

Significance of Study

Many types of chronic kidney disease have the potential to carry into adulthood. Fostering healthy lifestyles for chronically ill adolescents is imperative because their life expectancy has increased (Maeda, 1996). Identifying major determinants of alcohol and tobacco use in adolescents with chronic kidney disease is needed to create preventive strategies.

Jessor (1991) stated that risk behavior is the result of complex interactions among biopsychosocial variables. Relationships between risk behavior and these variables will

provide useful information to understand risk behaviors of adolescents with chronic illnesses. Although many studies have been conducted to explore alcohol and tobacco use by healthy Japanese adolescents, it should be noted that over the last two decades that the rate of alcohol and tobacco use by this group has increased rather than decreased (Kawabata et al., 1998; Suzuki, 1997). The research needs to be extended to understand alcohol and tobacco use by special populations within a biopsychosocial perspective. The health promotion field would benefit from future efforts to explore in more detail health promotion for previously understudied special populations such as chronically ill adolescents (Millstein et al., 1993). Prevention programs for healthy adolescents in Japan have aimed at increasing adolescents' knowledge about the harmful effects of alcohol and tobacco and development of refusal skills (Kawabata, 1995). This study can help create more prevention programs by broadening this focus to include other variables such as perceived environment, personality, and behavior.

Research Questions and Research Hypotheses

This study addressed the following research questions and research hypotheses. The first research question, which does not have a hypothesis, is as follows:

Research Question 1: What is the frequency of alcohol and tobacco use among Japanese adolescents with chronic kidney disease?

Research Question 2 and Hypothesis 1 address the relationship between the perceived environment and risk behavior:

Research Question 2: Are the following aspects of the adolescents' perceived environment system (parental use of alcohol and tobacco and parental norms of alcohol

and tobacco use by their adolescent children) associated with risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease?

Hypothesis 1: There will be a significant positive relationship between aspects of the adolescents' perceived environment system (parental use of alcohol and tobacco and parental norms of alcohol and tobacco use by their adolescent children) and risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease.

Research Question 3 and Hypothesis 2 address the relationship between the personality system and risk behavior:

Research Question 3: Are the following aspects of the personality system (autonomy and attachment to parents) associated with risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease?

Hypothesis 2: There will be a significant relationship between aspects of the personality system (autonomy and attachment to parents) and risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease.

Research Question 4 and Hypothesis 3 address the relationship between the behavior system and risk behavior:

Research Question 4: Are the following aspects of the behavior system (nonadherence, school absence, and club activity involvement) associated with risk behaviors of alcohol and tobacco use by chronic kidney disease?

Hypothesis 3: There will be a significant positive relationship between aspects of the behavior system (nonadherence, school absence, and club activity involvement) and risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease.

Research Question 5 and Hypothesis 4 address the relationship between illness-related characteristics and risk behavior:

Research Question 5: Are the following aspects of the illness-related characteristics (illness duration, frequency of clinic visits, and hospitalization episodes) associated with risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease?

Hypothesis 4: There will be a significant positive relationship between the following aspects of the illness-related characteristics (illness duration, frequency of clinic visits, and hospitalization episodes) and risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease.

Research Question 6 and Hypothesis 5 address the relationship between demographic characteristics and risk behavior:

Research Question 6: Are the following demographic characteristics (age, gender, and number of older siblings) associated with risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease?

Hypothesis 5: There will be significant positive relationships between demographic characteristics (age, gender, and number of older siblings) and risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease.

Research Question 7 and Hypothesis 6 address the relationship between selected independent variables and risk behavior:

Research Question 7: How much variability in risk behavior by adolescents with chronic kidney disease can be explained by selected variables within the five domains of

perceived environment system, personality system, behavior system, illness-related characteristics, and demographic characteristics?

Hypothesis 6: There will be a significant relationship between risk behaviors of alcohol and tobacco use by adolescents with chronic kidney disease and selected variables within the five domains: perceived environment, personality system, behavior system, illness-related characteristics, and demographic characteristics.

Conceptual Framework

The conceptual framework for this study was derived from Jessor's (1991) problem behavior theory. This theory is presented in the following order: (a) meanings of risk behavior, (b) conceptual domains, and (c) risk and protective factors. Cultural and population-specific modifications of the Jessor's model are presented and applied to this study. The conceptual framework of this study in relation to alcohol and tobacco use among chronically ill adolescents is described.

Meanings of Risk Behavior

The conceptual framework of this study is based on Jessor's (1991) problem behavior theory, which is known as the most well-developed, comprehensive, and tested theory of adolescent risk behavior (DiClemente, Hanse, & Ponton, 1996). In contrast to the traditional view of risk behavior among adolescents as recklessness, Jessor included the concept that risk behavior has meaning for adolescent development. According to Jessor (1991), problem behaviors in adolescents, such as alcohol and tobacco use, should be perceived as being purposeful, meaningful, goal oriented, and functional rather than

arbitrary. In his view, psychosocial functioning is instrumental to engagement in risk behavior. Risk behavior may be used to gain acceptance and respect from the adolescents' peers; to establish autonomy from parents; to repudiate norms and values of conventional authority; to cope with anxiety, frustration, and anticipation of failure; or to affirm maturity and make a transition from childhood to adulthood (Jessor, 1991, 1993).

Conceptual Domains

In Jessor's (1991) model, adolescent risk behavior is explained by risk and protective factors that are divided into five domains: biology and genetic system, social environment system, perceived environment system, personality system, and behavior system. The likelihood of the occurrence of problem behavior for any adolescent is the combined risk or proneness to cross over these explanatory domains (Jessor, 1987, 1991, 1993). Each of Jessor's domains is regarded as having both direct and indirect effects on adolescent risk behavior and bi-directional causal interaction.

Risk and Protective Factors

Although each domain has a set of variables that are labeled by two groups, risk factors and protective factors, there is a lack of clarity about the definition of risk and protective factors among those variables. For example, Jessor (1991) defined low self-esteem in the personality domain as a risk factor; however, high self-esteem is not defined as a protective factor. In addition, all variables in five domains have not been distinguished as either risk or protective factors among chronically ill adolescents. The model was tested in this study to determine which of the independent variables are risk or

protective factors. The variables selected for this study will be defined as risk or protective factors.

Aspects of the Model Not Applied to Japanese Adolescents

Some variables in problem behavior theory have been tested and supported for Taiwanese adolescents (Chen, 1997). This cross-cultural comparative study of sexual risk behavior between Taiwanese and American adolescents aged from 13 to 18 years old found that the problem behavior theory was supported more strongly for Taiwanese adolescents than for Americans. Age and family stress were associated with sexual risk behaviors of Taiwanese youths. However, problem behavior theory has not been tested in Japanese adolescents. Of Jessor's (1991) five explanatory domains, three were addressed in this study. Two domains were not included. The first of these, the domain biology-genetics, includes two variables: family history of alcoholism and high intelligence. Family history of alcoholism has been proposed as a predictor of adolescents' psychological problems such as depression (Suzuki, 1995). However, depression is not the focus of this study. High intelligence in this domain is difficult to operationalize. Existing tests of intelligence do not measure all aspects of intelligence. The other domain, social environment, contains variables such as poverty or racial inequality. Japan has a homogeneous population which consists of only 1% immigrants. In addition, about 80% of Japanese families, which consist of two parents and two children under 18 years of age, earn more than 4,500,000 yen (37,500 U.S. dollars, 1 dollar is equivalent to 120 yen) per year (Health and Welfare Statistics Association, 1998). Therefore, such families in Japan fall within the middle-class income range. Moreover, unlike the United States,

medical and health care expenditure will not cause severe financial burden for families because the national health insurance system covers most medical care costs of chronically ill adolescents. Therefore, two domains, the biology-genetics system and social environment system, were excluded from this study.

Issues in Jessor's Problem Behavior Theory Applied to Chronically Ill Population

Although the variables in these four domains have been tested in various studies of healthy American adolescents (Donovan, Jessor, & Costa, 1991; Jessor, 1987, 1991, 1993; Jessor, Donovan, & Costa, 1991; Jessor, Van Den Bos, Vanderry, Costa, & Turbin, 1995), few studies have investigated combinations of these variables in chronically ill adolescents. Furthermore, variables in each conceptual domain for this study were selected based on previous studies related to chronically ill adolescents.

Conceptual Domains Used in the Current Study

Theoretically, an ideal study would include all the variables in Jessor's (1991) problem behavior theory because this would give the best possible explanation of adolescent risk behavior. However, such a study is difficult, if not impossible, because participants would be greatly inconvenienced and exhausted in providing such comprehensive information at one time. Based on the findings from the literature, presented in chapter 2, three conceptual domains in Jessor's (1991) theory were used for this study: (a) perceived environment, (b) personality, and (c) behavior. Each conceptual domain is divided into subdomains having both risk and protective factors, but those factors have not been tested in adolescents with chronic illnesses. The conceptual model

presented in Figure 1 is a modification of Jessor's (1991) problem behavior theory. It identifies the relationships to be examined in this study. Except for nonadherence in the domain behavior system, the set of variables in the perceived environment system, personality system, and behavior system have been useful in predicting and explaining risk behavior of adolescents without chronic illness (Jessor, 1987). A review of the relevant literature did not reveal any studies in which this combination of variables was studied in chronically ill adolescents.

Perceived environment system. Behavior is best understood within social and environmental contexts (Guthrie, Loveland-Cherry, Frey, & Dielman, 1994). The perceived environment system reflects environmental characteristics such as supports, influence, controls, models, and expectations of others. Those environmental characteristics greatly influence adolescents' problem behavior because adolescents learn such behavior from their environment, especially from their parents (Kawabata, 1991a). The environment as perceived by chronically ill adolescents affects their risk behavior. According to the conceptual model in this study (Figure 1), a positive relationship was hypothesized between the risk behavior of adolescents with chronic kidney disease and variables in the perceived environment domain: parental use of alcohol and tobacco and norms of alcohol and tobacco use by adolescents.

Personality system. The personality system is at the sociocognitive level and reflects social meanings and developmental experience. Concepts in the personality system are related to values, expectations, beliefs, attitudes, and orientations toward

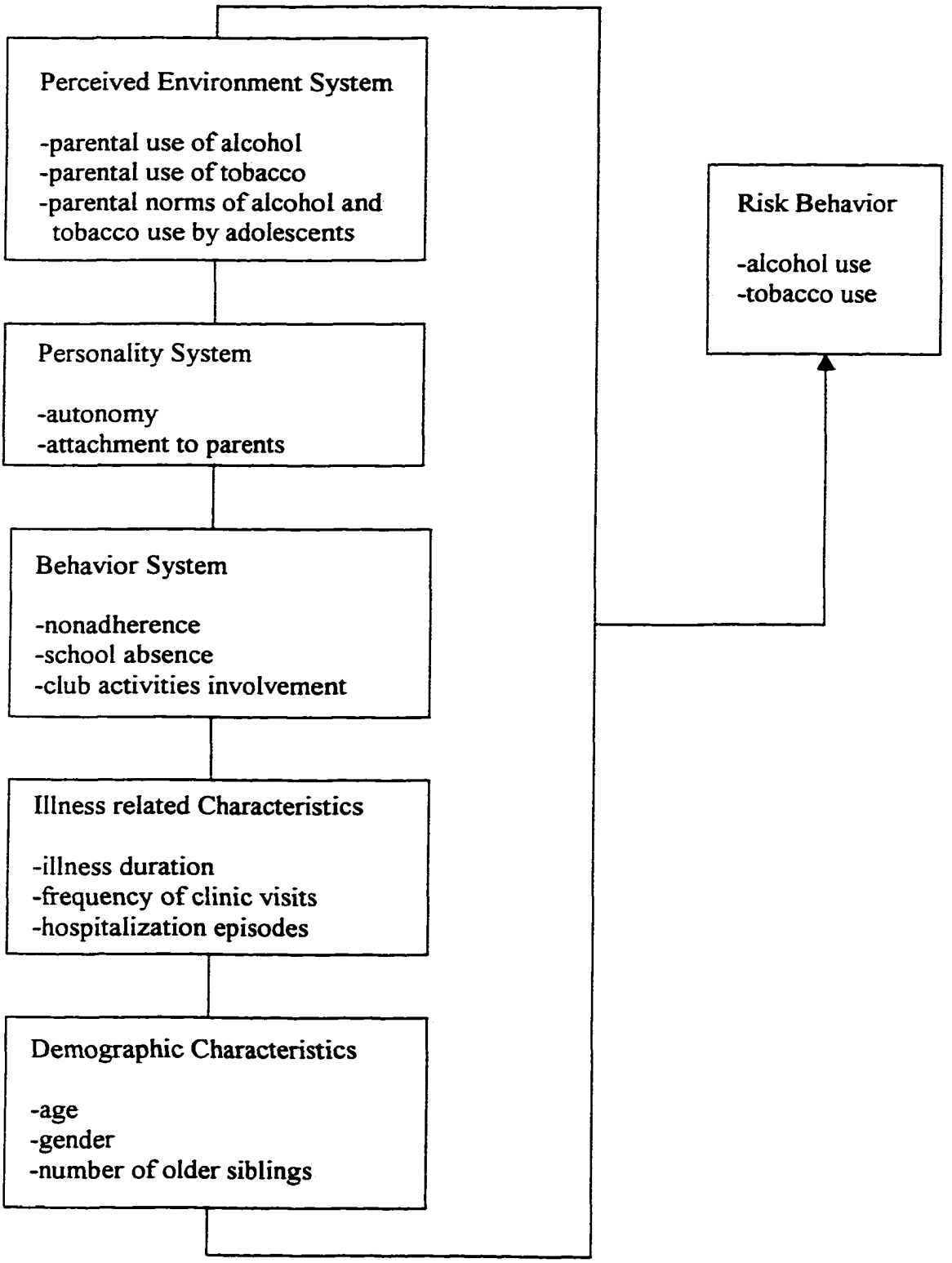

Figure 1. Determinants of alcohol and tobacco use by adolescents with chronic kidney disease.

oneself and others. Two variables included in this domain are self-reliance and attachment to parents. The conceptualization of autonomy in terms of subjective feelings of self-reliance or self-governance is common in the psychological literature though it often also appears as independence, locus of control, or assertiveness. (Steinberg & Silverberg, 1986). Self-reliance as one aspect of psychosocial maturity (Greenberg, Siegel, & Leitch, 1983) is composed of an absence of excessive dependency on others, a sense of control over one's life and initiative. Self-reliance is an important psychological variable, which is potentially disturbed among chronically ill children and adolescents. Jessor (1991) stated that adolescents may gain autonomy by engaging in risk behavior. A negative relationship was hypothesized between self-reliance, conceptualization of autonomy, and risk behavior by adolescents with chronic kidney disease.

Adolescents' attachment to parents is related to the development of autonomy. Developing autonomy while maintaining optimal attachment is necessary for healthy adolescents as well as for chronically ill adolescents (Holmbeck, 1994). Attachment is generally described as an enduring affectional bond of substantial intensity (Paterson, Pryor, & Field, 1995). There are different terms to describe the characteristics of attachment and studies about attachment styles in relation to risk behavior. Though secure attachment has been studied in terms of adolescents' social adjustment (Kenny & Rice, 1995), dysfunctional aspects of attachment have also been studied in relation to adolescents' engagement in risk behavior. For example, insecure attachment has been reported to be a significant predictive variable of substance misuse (Baer & Bray, 1999; Turner, Irwin, & Millstein, 1991). Cooper, Shaver, and Collins (1998) stated that adolescents with anxious-ambivalent attachment to parents are likely engage in risk

behavior such as alcohol use and sexual behavior. Some researchers have made distinctions between emotional autonomy, attachment, and detachment, and there are diverse definitions about attachment (Lamborn & Steinberg, 1993; Ryan & Lynch, 1989; Schneider & Younger, 1996). In this study, attachment was defined as the affective quality of the adolescent's relationship with his or her parents, including emotional ties to parents. (Holmbeck, 1994). A relationship was hypothesized between attachment and risk behavior by adolescents with chronic kidney disease.

Behavior system. The behavior system includes various behaviors such as repudiating conventional norms, affirming independence from parents, and gaining status in peer group. Jessor (1987, 1991) defined school absence as deviant behavior and club activity involvement as conventional behavior. For chronically ill adolescents, these two behaviors are often influenced by their health condition. Adolescents will be isolated if they need to be absent from school and cannot participate in club activities. Such chronically ill adolescents are at risk to engage in alcohol and tobacco use because they are eager to be accepted by the peer group. In this study, school absence and club activity involvement was hypothesized to have a relationship with the risk behavior of chronically ill adolescents.

Jessor (1991) suggested that there is covariation among risk behaviors. A pattern of engaging in various risk behaviors such as alcohol and tobacco use may be associated with the health-risking behavior of nonadherence by chronically ill adolescents (Hanna, 1993). However, the possible relationship between substance use and nonadherence has

rarely been examined. Therefore, nonadherence was also included in this domain and was hypothesized to have a relationship with the risk behavior of chronically ill adolescents.

Illness-related characteristics. Illness-related characteristics are added to the proposed model because they are especially important to the exploration of behavior of chronically ill adolescents. Isaji (1996) reported that the most frequent concerns of Japanese family members of chronically ill children and adolescents were related to school or school activities, followed by concerns related to medical diagnosis and treatment. The duration of illness and frequency of clinic visits and hospitalization episodes influence the social functioning of chronically ill adolescents. Adolescents who cannot socially function because of chronic illness are more susceptible to risk behavior to gain peer acceptance. In this model, these three variables were hypothesized to have relationships with chronically ill adolescents' risk behavior.

Demographic characteristics. It has been shown that risk behavior increases as adolescents grow older. In Japanese studies, males used alcohol and tobacco more than females (Kawabata, 1991a; Matsushita et al., 1996; Osaki & Minowa, 1996; Wada & Fukui, 1994). The number of older siblings was also related to alcohol and tobacco use among Japanese adolescents because older siblings provided opportunities for younger siblings to learn about alcohol and tobacco use (Kawabata et al., 1991a; Maru, Tanaka, Kurayama, & Fujisawa, 1998). In the proposed model, these variables were hypothesized to have positive relationships with risk behavior of chronically ill adolescents.

Summary of Conceptual Framework

The conceptual framework for this study was developed using Jessor's (1991) concept of risk behavior and three conceptual domains of his problem behavior theory: (a) perceived environment system, (b) personality system, and (c) behavior system. However, variables in each domain were selected based on a literature review related to chronically ill adolescents. Two domains, illness-related characteristics and demographic characteristics, were added. The five conceptual domains, which include two newly added domains, are perceived environment system, personality system, behavior system, illness-related characteristics, and demographic characteristics. These domains are associated with each other, and these five domains are hypothesized to have a direct relationship on the risk behavior of alcohol and tobacco use among chronically ill adolescents.

Definition of Terms

The following terms were used in this study:

Adolescents: Individuals in Japan between 15 to 18 years of age who are in high school. In Japan, 96.7% of all adolescents attend high school (Japanese Ministry of Education, Sports, and Culture, 1995).

Chronic kidney disease: Diagnoses including chronic kidney disease: (a) chronic nephritis including IgA nephritis, (b) nephrotic syndrome or nephrosis, (c) nephritis related to systematic lupus elitematodes, and (d) other types of nephritis requiring medications. Disease conditions are not directly affected by short-term effects of alcohol and tobacco use. A chronic health condition resulting from chronic kidney disease is an

ongoing health condition that has one or more of the following current or future long-term outcomes: (a) dependency on medication or special diet for normal function or control of condition; (b) limitation of physical activities appropriate for age and development; requirement of regular clinic visits; and (c) special ongoing treatments or self-monitoring of disease conditions at home or in school (Stein, 1992).

Risk behavior: Behavior that can compromise physical and psychosocial aspects of successful adolescent development (Jessor 1991). In this study, risk behavior consisted of two behaviors: alcohol use and tobacco use.

Alcohol use: Adolescents' self-report of drinking alcohol in terms of frequency and quantity.

Tobacco use: Adolescents' self-report of the quantity of cigarettes smoked in the past month.

Parental use of alcohol and tobacco: Adolescents' report of parental use of alcohol and tobacco.

Parental norms of alcohol and tobacco use: Adolescents' perceptions of parental beliefs about alcohol and tobacco use by adolescents.

Self-reliance: Adolescents' self-report of subjective feelings of self-reliance, which are the operationalization of autonomy (Steinberg & Silverberg, 1986).

Adolescent attachment to parents: Adolescents' subjective feelings of emotional ties to their parents. (Holmbeck, 1994).

Nonadherence: The extent to which a person's behavior does not coincides with medical or health advice. Adolescents' self-report of refusal or failure to take medication and general treatment regimen non-participation (La Greca & Schuman, 1995).

School absence: Adolescents' self-report of the number of days when adolescents leave or are absent from school within 1 year.

Club activity involvement: Being a club member and participating in club activities.

The duration of illness: The length between the time of diagnosis to the present time as indicated by medical records.

Frequency of clinic visits: The frequency of clinic visits by adolescents in the past year as indicated by adolescent self-report.

Hospitalization episodes: The frequency of hospitalization during the past year as indicated by medical records.

Demographic characteristics: Age in years, gender, and number of older siblings recorded by each adolescent on the demographic information sheet.

Assumptions

For the purpose of this study, the following assumptions were made:

1. Adolescents will report their experiences with risk behavior if the confidentiality of the data is protected.

2. Cognition affects behavior.

3. Adolescent risk behavior is the result of interactions with numerous factors.

Limitations

For the purpose of this study, the following limitations were identified:

1. The measurement of the study variables by self-report questionnaires may reflect socially desirable response. To minimize social desirability, the data collection procedure will be conducted anonymously and confidentiality will be protected.

2. Generalization of the findings from this study is limited because of the planned sampling technique. There may be possible atypical responses that are due to the voluntary nature of the sample.

3. Causal relationships cannot be determined because of the nature of the cross-sectional design and theoretical framework, which indicates that bidirectional relationships between conceptual domains and risk behavior.

Summary

In this chapter, risk behavior of chronically ill adolescents and healthy Japanese adolescents was reviewed. The lack of knowledge about risk behavior among Japanese adolescents with chronic kidney disease was addressed. The purpose of the study and its significance to nursing were outlined. Seven research questions and six hypothesis were presented for this investigation. The conceptual framework of risk behavior of chronically ill adolescents based on Jessor's problem behavior theory was described. The study variables were identified, and salient terms were theoretically and operationally defined. Assumptions underlying this study and limitations inherent in the research design were noted.

CHAPTER 2

REVIEW OF THE LITERATURE

In this chapter, the main variables tested in this study are reviewed and synthesized. Those variables are divided into six sections: (a) risk behavior, (b) perceived environment, (c) personality, (d) behavior, (e) illness-related characteristics, and (f) demographic characteristics.

Risk Behavior

Findings in studies related to risk behavior among adolescents are summarized in this section in the following order: (a) substance use of healthy Japanese adolescents, (b) alcohol and tobacco use among healthy Japanese adolescents, (c) demographic characteristics of alcohol and tobacco users in Japan, and (d) substance use among chronically ill adolescents.

Substance Use of Healthy Japanese Adolescents

Previous studies of Japanese adolescent risk behaviors have focused on alcohol and tobacco use because other risk behaviors such as use of thinner inhalants were engaged in by only 1.4% of high school students (NHK Housou Bunka Kennkyuujyo Yoron Cyousa bu, 1995). Another nationwide study also showed that substance use exclusive of alcohol and tobacco was less than 1% (Wada & Fukui, 1994). On the other

hand, a large number of adolescents have experienced alcohol and tobacco use (Kawabata, 1991a; Osaki & Minowa, 1996; Suzuki, 1995). Thus, alcohol and tobacco can be defined as the substances used most often by Japanese adolescents and as posing the greatest risk.

Alcohol and Tobacco Use Among Healthy Japanese Adolescents

Suzuki et al. (1991) surveyed 14,438 Japanese high school students about their drinking behavior. In his study, 39.5% were described as normal adolescents who drank none or little and 43.2% were drinkers. The latter group of adolescents drank several times a week and had at least two drinks each time. Among the drinkers, 17.4% were problem drinkers who drank at least 3 drinks once a week or at least 6 drinks once or twice a month. One nationwide study (NHK Housou Bunka Kennkyuujyo Yoron Cyousa bu, 1995) also showed similar trends. Of 1,459 junior and senior high school students who were randomly selected from 150 cities in Japan, 52% had drunk alcohol at least once during their life (NHK Housou Bunka Kennkyuujyo Yoron Cyousa bu).

As the sample age becomes older, the rate of substance use becomes higher. Matsushita et al. (1996) investigated 11,683 high school students for alcohol use and found that 74.7% of them used alcohol at some time during their life. Adolescents' experimental use of alcohol or tobacco once in their life may be an acceptable behavior for most Japanese families; however, the initiation of substance use potentially leads to regular use within the adolescent period (Irwin & Millstein, 1992). Kandel and Logan (1984) further reported that early initiation of substance use usually became heavy use in later years.

Suzuki et al. (1991) surveyed alcohol use of 8,538 high school students and reported that 42.1% of students drank alcohol with their friends. In this study, 26.6% of students drank at either izakaya or nomiya (a bar-type restaurant) where alcohol was served with snacks or various foods in a casual atmosphere. Of drinkers, 20.7% bought alcohol beverages at the supermarket or a vending machine and drank them at friends' houses (Suzuki, 1995, 1997). More than 45% of the high school students drank alcohol more than once per month without parental supervision. Studies have shown that alcohol use normally becomes a part of most Japanese adolescents' lives (Omoto, 1997; Suzuki, 1997).

Alcohol and tobacco use in Japanese adolescents have gradually increased during the past decade (Kawabata et al., 1998; Suzuki, 1995). Suzuki (1995) emphasized that the prevalence of alcohol use among high school students was 10 times higher than during the 1980s. Jessor (1991) stated that early engagement in substance use, especially alcohol and tobacco, usually leads to heavy use in adulthood. It is possible that adolescents' use of alcohol and tobacco turn to heavy use in their adulthood, which increases the risk of chronic health conditions such as cancer, diabetes, and cardiovascular disease. It is also possible that adolescent substance users become abusers. Suzuki (1997) showed a gradual increase of alcoholics among young adults. However, most studies about alcohol and tobacco use in Japanese adolescents have tended to examine the rate of use. Missing from these studies are investigations of the determinants of alcohol and tobacco use in adolescents; this lack of information could be one of the reasons for the increase in the prevalence of substance users.

Demographic Characteristics of Alcohol and Tobacco Users in Japan

The numbers of smokers in the Japanese population, especially among males, is high compared with other industrialized countries (Takei, 1993). Close to 60% of males aged 20 to 65 years are smokers. Although only 10.8% of Japanese females are smokers, the rate of smoking in people by their 20s and 30s has increased since the 1960s (Takano & Nakamura, 1996). Furthermore, according to the Japan Tobacco Corporation, the prevalence of smoking in women in their 20s was 16.6% in 1985 and increased to 19.5% in 1990. In a nationwide survey in 1995, the prevalence of smoking in women in their 20s was 23.3%. This was the highest rate reported since the Japan Tobacco Cooperation's surveys were begun in 1965 (Kawane, 1993).

Tobacco use among Japanese healthy adolescents reflects the demographic characteristics of adult users. Osaki and Minowa (1996) surveyed tobacco use in 57,189 junior and senior high school students. The results show a gradual increase in tobacco use among males as their age increases. Female tobacco use did not steadily increase; however, the rate of tobacco use in grade 12 was higher than in grade 7 (The Japanese educational system uses the single-track system, based on a 6-3-3-4 sequence of elementary, middle and high school curricula, and university; junior high school students are equal to 7th, 8th, and 9th graders in the United States, and senior high school students are equal to 10th, 11th, and 12th graders). Similar gender differences and changes across age groups were supported by other studies (Kawabata, 1991a; Matsushita et al., 1996; Wada & Fukui, 1994).

Kawabata et al. (1991a) investigated alcohol use among 12,892 students from age 9 to 18 years. The number of students who drank at least once during the past month

gradually increased as age increased in both genders, and male students drank significantly more than female students did. Of those drinkers, 59% were male and nearly 50% were female. Female students use alcohol more frequently than tobacco. Omoto (1997) pointed out that female drinkers among young adults increased after the 1960s. Suzuki (1997) summarized his series of studies and also stated that the percentage of female drinkers (i.e., those who drank alcohol more than once per week) had increased since the 1980s.

In summary, previous studies have shown that the prevalence of alcohol and tobacco use among healthy Japanese adolescents increases as their age increases. The numbers of cigarettes smoked also increased as adolescents aged. Healthy Japanese adolescent males smoke and drank greater amounts and more frequently than females. Gender differences are smaller in alcohol use than tobacco use in terms of both frequency and quantity.

Substance Use Among Chronically Ill Adolescents

The prevalence of substance use in adolescents with chronic conditions has been reported in the literature in varying degrees. One Finnish study (Bussing & Aro, 1996) examined alcohol and tobacco use among 1,233 subjects 16 to 22 years of age (454 of the subjects had chronic conditions, and 779 were healthy subjects). They found no differences between two groups. Contrary to this study, Steele et al. (1996) reported that adolescents with physical disabilities were less likely to use risky substances. They surveyed 101 American adolescents from 11 to 16 years of age with physical disabilities. Ninety-four percent of these subjects did not smoke, and all adolescents reported that

they had "never been drunk." Another study (Brook & Shiloh, 1993) suggested that adolescents with chronic conditions might not risk their health by using alcohol and tobacco. Brook and Shiloh studied tobacco use in 67 Israeli adolescents with asthma and 62 healthy adolescents from 15 to 18 years of age, who were recruited from an inner city high school in Israel. The prevalence of tobacco use among adolescents with asthma was 26% compared with 50% in the healthy control. Brook and Shiloh stated that asthmatic adolescents who perceived themselves vulnerable to smoking would not engage in tobacco use.

Three studies (Hollen & Hobbie, 1993, 1996; Mulhern et al., 1995) reported that substance use by cancer survivors was less than that of healthy adolescents. Mulhern et al. studied 110 American parents of long-term childhood cancer survivors ranging in age from 11 to 17 years and 40 long-term adult survivors ranging in age from 18 to 29 years. Only 8% of the parents of the adolescent cancer survivors reported alcohol and tobacco use by their children. The prevalence of current smoking by young adult survivors was 15% of all survivors. Mulhern et al. suggested that parents might underestimate substance use by their children. Barakat et al. (1997) reported that parents of childhood cancer survivors had higher stress than parents with healthy children; however, the survivors themselves had no differences from healthy peers. It can be said that survivors engage in risk behavior just like healthy peers, whereas their parents still regard their children as sick children and do not know about or acknowledge their alcohol and tobacco use.

The low prevalence of alcohol and tobacco use in childhood cancer survivors was also found in two other studies (Hollen & Hobbie, 1993, 1996). Hollen and Hobbie (1993) surveyed 36 American childhood cancer survivors about risk behavior, including

alcohol and tobacco use. Survivors were between 12 and 19 years old and had been diagnosed between the ages of birth and 14 years, had been disease free for 5 years, and had received no medical treatment within the past 2 years. In this study, the prevalence rate of alcohol use was 67% and tobacco use was 53%. Hollen and Hobbie (1993) estimated those percentages were at the same level or less than those of healthy controls. Hollen and Hobbie (1996) replicated this study using 52 cancer survivors from 14 to 19 years old. The prevalence rate of alcohol use was 71% and tobacco use was 48%. In both of these studies, the prevalence of risk behavior in cancer survivors was lower than a comparable healthy population.

Childhood cancer survivors keep their nonsmoking habit even after they reach adulthood age. Haupt et al. (1992) studied 1,289 adult survivors of childhood cancer and 1,930 of their sibling as controls. In this study, survivors were less likely to be current smokers or to have ever smoked compared with their siblings. However, adult survivors were less likely to smoke. Haupt et al. suggested that once cancer survivors started smoking, they may be more likely to continue than those without chronic conditions.

The rate of substance use in diabetic adolescents was also reported as less than in their healthy peers. Shaw, McClure, Kerr, Lawton, & Smith (1993) surveyed tobacco use in insulin-dependent diabetic (IDDM) adolescents aged 11 to 18 years old with the duration of diabetes ranging from 1 month to 16 years. These subjects lived in Liverpool in the United Kingdom. The authors used urinary cotinine/creatinine ratio to assure the validity of the self-report questionnaire. The self-report questionnaire was supported as an accurate method to measure tobacco use by this test. In 77 IDDM adolescents, only 6 adolescents, 7.8%, were confirmed as regular smokers by both the questionnaire and the

urine test. Frey, Guthrie, Loveland-Cherry, Park, & Foster (1997) investigated 155 American adolescents aged 10 to 20 years with IDDM about risk behavior such as alcohol, tobacco, smokeless tobacco, and other drug use and unprotected intercourse. In the past month, only 30% of the adolescents with IDDM drank alcohol and 27% of them smoked cigarettes.

Two studies (Forero, Bauman, Young, Booth, & Nutbeam 1996; Gold & Gladstein, 1993) reported a higher incidence of substance use among chronically ill adolescents than among healthy ones. Forero et al. surveyed 4,550 Australian adolescents, aged 11 to 15 years, to compare the prevalence of alcohol and tobacco use between asthmatic and healthy adolescents. By using a self-report questionnaire of asthmatic symptoms, 797 adolescents, or 17.5% of the subjects, were classified asthmatic. Prevalence of being drunk, frequent drinking, and daily and weekly smoking were significantly higher in asthmatic adolescents than in nonasthmatics. Of the asthmatic adolescents, 68% drank alcohol compared with 60% of nonasthmatics ($\underline{x}^2 = 18.89$, $\underline{p} < .04$). More asthmatic adolescents than nonasthmatic adolescents reported having been drunk or drinking weekly or more frequently. Regarding tobacco use, 55% of the asthmatic adolescents had smoked tobacco compared with 41% of the non-asthmatic adolescents. However, Forero et al. used a self-report questionnaire about asthmatic physical symptoms to differentiate asthmatic adolescents from healthy adolescents. This method may have created false positives on respiratory symptoms unrelated to asthma. Although the authors concluded that asthmatic adolescents had a higher rate of alcohol and tobacco use than did their healthy counterparts, this sampling error might have increase the prevalence of substance use.

Gold and Gladstein (1993) studied American adolescents with IDDM and young adults, aged 11 to 25 years, who attended a diabetic sleep-away camp. Gold and Gladstein found that more than half of the 79 diabetes camp participants reported using alcohol or tobacco at least once. Results from the Adolescent Michigan Alcohol Screening Test (MAST) indicated about 25% of adolescents with diabetes demonstrated dangerous drinking behavior such as binge drinking.

In summary, it has not been determined conclusively whether chronically ill adolescents use alcohol and tobacco more than their healthy peers. Self-report questionnaires have been used to ask about alcohol and tobacco use among chronically ill adolescents. One study (Shaw et al., 1993) studied the validity of self-report questionnaire of tobacco use by using a urine assay and verified the answers on the self-report questionnaire. Findings suggest that parents might not know about or may overlook alcohol and tobacco use by their children. Identifying chronic conditions by adolescents' self-report might include healthy adolescents, thus influencing the prevalence of alcohol and tobacco use.

Pediatric Chronic Kidney Disease in Japan

In terms of disease characteristics and treatment modalities, Japanese adolescents with chronic kidney disease have several different issues. Various psychosocial problems have been reported related to chronic kidney disease.

Disease characteristics and treatments. Of 121,000 chronically ill children and adolescents, about 15% had chronic kidney disease such as primary chronic glomer-

ulonephritis, including IgA nephropathy, or secondary chronic glomerulonephritis. Many types of pediatric kidney disease have the potential to carry over into adult age; therefore, the school urinary screening program was initiated by the Japanese government in 1974 for early detection (Iitaka, Igagarashi, & Sakai, 1994). The urinary screening program has been performed in the first- to ninth-grade school children each year. These data were used to reveal the prognosis of pediatric kidney disease.

IgA nephropathy is the most common prevalent glomerular disease among Japanese children (Ito, Yoshikawa, & Honda, 1999). Long-term follow-up of 241 Japanese children indicated that 5% of the patients had developed chronic renal failure 5 years after the onset of the disease, 6% after 10 years, and 11% after 15 years (Ito et al., 1999). Among primary chronic glomerulonephritis, IgA nephritis has the highest rate of carryover into adult age. The rate of carryover is decreased by heparin-warfarin and steroid therapy; however, the effective treatment protocol to prevent carryover has not been established (Igarashi, 1996). Another major type of chronic pediatric kidney disease is nephrotic syndrome. Although the cure rate of nephrotic syndrome has been dramatically improved by steroid therapy, about 10% to 20% of children with nephrotic syndrome do not respond to such therapy and tend to carry their disease into adult age. Children with steroid resistant nephrotic syndrome will develop this disease to end stage renal failure (ERSF) within 5 years. The carryover rates of other types of pediatric kidney disease is also high, 100% of focal segmental glomerulonephritis and about 30% of membranoproliferative glomerulonephritis (Igarashi). In addition to primary chronic glomerulonephritis, the secondary nephritis carries over into adult age, including 100% of Lupus nephritis. Because of the risk of carryover, adolescents with chronic pediatric

kidney disease should develop a healthy lifestyle and avoid unhealthy lifestyle choices such as alcohol and tobacco use.

For most pediatric chronic kidney disease, early diagnosis and treatment are essential to prevent disease prognosis from leading to chronic renal failure. The most common treatment for chronic kidney disease consists of medication, activity restrictions, and diet restrictions, including salt intake. Medication should be carefully prescribed by observing clinical symptoms and the results of urine tests. Degrees of activity and diet restrictions are varied depending on the diagnosis and the presence of critical symptoms such as hypertension or nephrosis. For acute stages, the restriction of salt intake to 6 to 7 g per day often causes nonadherence because the average Japanese salt intake is 13 g per day. A kidney biopsy is needed to make the final diagnosis or evaluation after the treatment. Routine clinic visits for evaluation will be needed even after children do not need to take medications. Long-term treatment by medications and restrictions of daily life may affect healthy growth and development of adolescents with chronic kidney disease.

Kidney transplantation is a very limited choice for the treatment of chronic pediatric kidney disease in Japan (Amemiya, 1996). Of 1,244 cases of kidney trans-plantation, 828 trans-plants were performed from a living related donor, and 408 were from cadaver donors with cardiac arrest. One hundred-fifty thousand patients are on dialysis, and 20,000 patients are on the waiting list for kidney transplantation (Takagi, 1997; Teraoka et al., 1995). The incidence of dialysis patients in Japan is about four times higher than in the United States (Research Group on Progressive Chronic Renal Disease, 1999). The dialysis patient population is increasing by 12,000 to 14,000 annually. Of the

total dialysis patients in 1996, 55.4% had primary chronic glomerulonephritis compared with 10.7% in the United States. Thus, a healthy lifestyle is needed for adolescents with chronic kidney disease to maintain kidney functions as long as possible.

Psychosocial problems. Numerous case studies or small sample studies about the psychosocial problems of children and adolescents with chronic kidney disease have been reported by each treatment institution. Japanese studies related to stress and social support among 360 chronically ill children and adolescents revealed that adolescents with chronic kidney disease had the highest stress and perceived lower social support (N. Nakamura et al., 1996; Nakamura et al., 1997).

One possible reason for these findings is related to their restriction of daily life and changes in body image caused by long-term medication, including steroids (N. Nakamura et al., 1996; Nakamura et al., 1997). Takeda et al. (1997) investigated 220 chronically ill children and adolescents about their daily self-care practice and school life. They reported that children and adolescents with chronic kidney disease had the highest rate of prescribed regimen, second to those with diabetes; moreover, children and adolescents with chronic kidney disease tended to have negative feelings about following the regimen.

Yamazaki and Amano (1993) studied pediatricians from 39 Japanese institutions across the nation and explored their perceptions of psychosocial problems of children with chronic kidney disease and their families. Of 38 institutions, 84% ($n = 32$) experienced adolescent patients who had psychosocial problems, including anxiety about side effects, low self-esteem related to changes in body image, anxiety about disease

prognosis, uncertainty for the future, and treatment refusal. In this study, pediatricians reported that parents expressed various concerns about their adolescent children, such as treatment refusal, social adaptation, dependency, pursuing academic goals, and job opportunities.

In summary, adolescents with chronic kidney disease have the potential to carry their disease into adulthood. Those adolescents' daily lives are restricted because of treatment. In addition, adolescents with chronic kidney disease have various psychosocial problems. Like other types of chronically ill adolescents with various illnesses, adolescents with chronic kidney disease may engage in risk behavior such as alcohol and tobacco use. However, little is known about this issue among this population.

Perceived Environment

The perceived environment of chronically ill adolescents affects their risk behavior Variables included in this domain are parent's use of alcohol and tobacco and parents' norms toward adolescents' use of alcohol and tobacco. Significant relationships between variables in this domain and risk behavior have been repeatedly studied among healthy adolescents; however, few studies have been done on chronically ill adolescents.

Parental Use of Alcohol and Tobacco

Modeling of deviant behavior by parents has been shown to be a significant predictor of risk behavior (Jessor, 1991). Parental alcohol and tobacco use significantly affect adolescents' behavior. Nozu (1984) reported that the smoking behavior of mothers affected those of their female adolescents. In another study, Osaki and Minowa (1996)

showed that tobacco use in the past and current smoking habits for both male and female students was significantly more likely if mothers smoked. Kawabata et al. (1991a) found that the smoking rate of adolescents whose parents smoked was twice that of adolescents who had nonsmoking parents.

Parental Norms Toward Adolescents' Use of Alcohol and Tobacco

In addition to the parental modeling of alcohol and tobacco use, parental norms toward alcohol and tobacco may inhibit or facilitate adolescents' behavior (Kojima, Watanabe, & Aoki, 1997). Drinking a small amount of alcohol during family or regional gatherings is the major initial introduction to alcohol consumption in Japan. Japanese families allow adolescents to drink alcohol at dinner; that behavior is socially acceptable to a certain degree. In the Japanese national report on Alcohol Related Problems (Suzuki, 1993), it was stated that adolescents drank alcohol with parents or relatives secondary to friends. This attitude among family members is not seen in studies related to tobacco use among adolescents. Therefore, Japanese parents may regard drinking behavior as a part of social relationships.

Kojima et al. (1997) analyzed the pattern of alcohol use among 604 high school students in terms of parent-child relationship. Only 10% of adolescents perceived that their parents strictly prohibit their children from drinking alcohol. As frequency of drinking increased, fewer adolescents perceived that their parents prohibit drinking alcohol. Kojima et al. concluded that parental attitude toward alcohol use by adolescents was the major factor that influenced high school students' frequencies of alcohol use. Adolescents may first learn drinking behavior from their parents. However, a permissive

norm has been implicated in the initiation of alcohol use in early adolescence and maintenance of such behavior in middle-to-late adolescence.

Parents and peers are reported as the significant determinants of risk behavior among adolescents. However, the magnitude of peer influences on adolescents' health-endangering behaviors varies with the quality of the parent-adolescent relationship (Chassin, Presson, Sherman, & McConnell, 1995). Fuligni and Eccles (1993) found that young adolescents who reported that their parents had not provided increased opportunities for shared decision making tended to seek less advice from their parents and more advice from their friends.

Parental monitoring and positive relations were protective factors that decreased disruptive behavior and the likelihood of selecting substance-using friends among 5th and 7th grade students (Cohen, Richardson, & LaBree, 1994). Kojima et al. (1997) studied alcohol use in 604 healthy Japanese high school students and concluded that parental attitude toward adolescent drinking was the most important factor. A study of 337 Norwegian families indicated that children of parents who smoked and consumed moderate-to-large amounts of alcohol were more likely to adopt those risky behaviors (Rossow & Rise, 1994).

Personality

The personality system in Jessor's (1991) problem behavior theory is at the sociocognitive level and reflects social meanings and developmental experience. In this study, autonomy and adolescents' attachment to parents are variables to be studied. Review of studies related to personality is presented as follows: (a) studies examining the

relationship between personality variables and substance use, (b) autonomy and risk behavior, and (c) adolescents' attachment to their parents and risk behavior.

Studies Examining the Relationships Between Personality Variables and Substance Use

Since the late 1980s, preventive educational efforts have focused on self-esteem and refusal skills in Japan. However, despite these programs, tobacco use among Japanese junior high school students has increased (Kawabata et al., 1998). These studies used social learning theory as the theoretical framework; moreover, they examined the adolescent-peer relationships and self-esteem as a primary psychosocial variable which might predict risk behavior, especially tobacco use.

Despite the common acceptance of poor self-esteem as a causal factor of problem behavior, research suggests that higher self-esteem does not always translate into health enhancing or prosocial behaviors (Millstein & Igra, 1995). In addition, it has been suggested that risk taking itself can raise self-esteem (Kaplan, Johnson, & Bailey, 1987). Furthermore, a drop in self-esteem occurs in early adolescence, with subsequent later gradual improvement (Millstein & Igra). Therefore, self-esteem fails to explain negative health behaviors in late adolescence and young adulthood (Chassin et al., 1995). Having chronic illness may lower self-esteem. However, two studies reported that self-esteem in chronically ill adolescents and young adults did not differ from self-esteem in their healthy counterparts (Bussing & Aro, 1996; Gortmaker, Walker, Weitzman, & Sobol, 1990).

Beyond self-esteem, the following psychosocial variables have been examined as the determinants of alcohol and tobacco use among adolescents: depression, self-image,

perceived psychosomatic symptoms, perceived health status, decision making ability, and perceived risk of risky behavior. Few studies explored the relationship between psychosocial variables and substance use among chronically ill Japanese adolescents.

Matsuhita et al. (1996) surveyed 11,683 healthy Japanese high school students and found psychological reasons such as sadness or loneliness are more frequent in alcohol and tobacco users than in nonusers. Forero et al. (1996) also found asthmatic adolescents who were lonely used alcohol and tobacco more than those who were not lonely. Brook and Shiloh (1993) stated that, in understanding asthmatic adolescents' attitude toward smoking, poor self-image was a more key factor than one's objective medical status. In Forero et al.'s study, asthmatic adolescents endorsed more psychosomatic symptoms such as feeling low, irritable, headaches, backaches, nervousness, sleeping difficulty, or feeling dizzy than did healthy adolescents. However, it was also found that asthmatic adolescents use alcohol and tobacco more than the healthy control group.

On the other hand, Gold and Gladstein (1993) concluded that diabetic adolescent campers, who perceived their health status as good, were more likely to engage in risk behavior. Therefore, it can be said that the findings regarding the relationship between perceived health status and risk behavior are mixed. Hollen and Hobbie (1993, 1996) have focused on the quality of decision making related to risk behavior among cancer survivors based on the health belief model. However, a significant relationship has not been found. In contrast to these results, Ohtsu (1989) examined alcohol use in Japanese high school students without health problems and found that their ego state such as decision-making ability was significantly related to alcohol use. Frey et al. (1997)

examined the relationship between perception of risk and risk behavior, including alcohol and tobacco use, among 155 adolescents with IDDM. However, there was no significant difference in perception of risk between adolescents with IDDM who reported engaging in risk behaviors and those who did not.

In summary, most studies investigated the relationship between risk behavior and a single psychosocial variable, especially self-esteem for healthy adolescents. Only six studies examined alcohol and tobacco use among chronically ill adolescents in relation to psychosocial variables.

Autonomy and Risk Behavior

The development of adolescent autonomy is a normal part of healthy adolescents development that has the potential for both positive and negative health outcomes (Baumrind, 1991). Perrin (1991) stated that adolescents with chronic illnesses face the same developmental tasks as adolescents without illness. Jessor (1991) said that risk behavior such as alcohol and tobacco use was instrumental behavior to gain autonomy from parents. Chronically ill adolescents may strive to gain their autonomy because of physical conditions, yet it is important for adolescents to gain autonomy without using alcohol and tobacco (Holmbeck, 1994).

Perrin (1991) suggested the importance of paying special attention to the development of autonomy in chronically ill adolescents. Chronic illnesses often create special dependency needs physically as well as psychologically. In a study of parental concerns of adolescents children with chronic kidney disease (Yamazaki & Amano,

1993), dependency was one of their concerns expressed to physicians. Successful development of autonomy may be a significant task for chronically ill adolescents.

However, Jessor (1991) stated that adolescents may gain autonomy from their parents by risk behavior. In Jessor's study about adolescent problem drinking, adolescents who valued independence (orientation toward autonomy) were more likely to be problem drinkers. In addition, in a series of studies related to sexual risk behavior, an increase in one type of autonomy, behavioral autonomy, which was fostered by physical maturation, was significantly related to engaging in risk behavior (Irwin , 1993; Irwin & Millstein, 1992). Autonomy should be further studied to explore risk behavior among chronically ill adolescents.

One research report (Steele et al., 1996) suggested that parental protection may interfere with behavioral autonomy of chronically ill adolescents; therefore, it may decrease risk behavior of those adolescents. Steele et al. studied lifestyle and health behaviors of 104 adolescents youth with physical disabilities aged 11 to 16 years old. Adolescents with disabilities were less likely to engage in health risk behavior such as alcohol and tobacco use compared with the national sample of adolescents without disabilities. It was suggested that overprotectiveness by parents restricted the influence of the peer culture and might contribute to the decreased peer influence of the likelihood for engaging risk behavior. Such overprotectiveness or particular health conditions such as immobility may disturb the development of autonomy, including self-reliance. Steele et al. suggested that underexposure to peer culture may result in a delayed but potentially more dangerous adoption of risk behavior. Therefore, Steele et al. suggested that such

adolescents need assistance to maintain their healthy lifestyles when they make the transition to independent living.

On the other hand, higher value on autonomy may possibly lead to engaging in risk behavior among adolescents. Jessor's longitudinal study supported the view that increased orientation toward autonomy significantly related to the likelihood of substance use among adolescents (Jessor, 1987). However, there are few studies about chronically ill adolescents' substance use in relation to their development of autonomy.

Risk Behavior and Adolescents' Attachment to Their Parents

Lamborn and Steinberg (1993) reported that the adaptiveness or maladaptiveness of another type of autonomy, emotional autonomy, depends on the quality of the parent-adolescent attachment. Holmbeck (1994) stated that healthy development of autonomy is not necessarily being separated from attachment to parents. Therefore, attachment to parents may be a necessary precondition to autonomy. Holmbeck stated that the improvement of autonomy without sacrificing adolescents' attachment to their parents is a developmental task for adolescence. Unlike the traditional view of the period of conflicts and resistance to parents, Steinberg and Silverberg (1986) found that most adolescents maintain close relations with their parents. It has been suggested that the quality of the parent-adolescent relationship plays an important role in lifestyle choices such as alcohol and tobacco use, even into late adolescence. Greenberg et al. (1983) reported that adolescents' attachment to parents was significantly related to the lifestyle of adolescents. Turner et al. (1991) found that adolescents are less likely to abuse substances when parents provide emotional support and acceptance, as well as when parents have a close

relationship with their children. A 4-year longitudinal study of over 2,000 children in southern California (Cohen et al., 1994) revealed that children who reported that their parents spent more time with them and communicated with them more frequently had lower initiation rates of using alcohol and tobacco. Kojima et al. (1997) also reported that high school students who talked about daily happenings with their parents drank less frequently than those who did not. Findings indicate that a good parent-adolescent relationship is a preventive force for adolescents to avoid risk behavior. However, the conflicts between parents and adolescents are not related to risk. Bussing and Aro (1996) studied Finnish adolescents with chronic conditions about risk behavior. Compared with healthy peers, Finnish adolescents with chronic conditions had more conflicts; however, there were no differences between those two groups of adolescents in risk behavior. The actual presence of conflicts between parents and adolescents might not alone reflect the quality of parent-adolescents relationships. Turner et al. (1991) suggested that emotional detachment, emotional withdrawal from the family context, is a powerful predictor of initiation and maintenance of risk behavior.

In summary, studies support that the quality of the parent-adolescent relationship is related to alcohol and tobacco use among adolescents. However, there have been few studies about how the quality of parent-adolescent relationships affects the engagement in risk behavior among chronically ill adolescents.

Behavior

Variables in this behavior domain include nonadherence, school absence, and club activity involvement.

Nonadherence

Jessor (1991) stated that risk behaviors do not occur in isolation. Furthermore, involvement in one type of risk behavior has also been found to increase the likelihood of becoming involved in other risk behaviors (Igra & Irwin, 1995). The correlation of risk behaviors was supported by Japanese studies related to alcohol and tobacco use. Matsushita et al. (1996) found that tobacco users drink more than nonusers do. Because one type of risk behavior may associate with another type of risk behavior, chronically ill adolescents who use alcohol and tobacco may not adhere to their prescribed regimens.

Nonadherence in terms of treatment refusal, refusal to take prescribed medication, and general treatment regimen nonparticipation among adolescents were repeatedly investigated (La Greca & Schuman, 1995). However, there has been little examination of the relationship between risk behavior and nonadherence.

A few studies have investigated variables related to nonadherence. Gold and Gladstein (1993) reported that disease denial and poor perceived diabetic control were related to alcohol and tobacco use among 79 diabetic adolescents. In a study of adolescent childhood cancer survivors, adolescents who did not have sufficient knowledge about late effects of therapy such as susceptibility to cancer and chronic disease or who were not concerned their health tended to use alcohol and tobacco more than the healthy control group (Mulhern et al., 1995). Frey et al. (1997) examined 155 adolescents with IDDM about the relationship between risk behavior and risk perceptions, including items related to risk diabetic conditions. However, no significant differences were found in the perception of risk between substance users and nonusers. Hanna (1993) reviewed the literature related to risk behavior of adolescents with cancer and concluded that non-

adherence may be associated with risk behaviors such as alcohol and tobacco use. However, few studies have investigated the relationship between nonadherence and risk behavior among adolescents with chronic illness.

School Attendance and Club Activity Involvement

School attendance and club activity involvement is identified as conventional behavior by Jessor (1991), and it is supported as a protective factor that prevents adolescents from engaging in problem drinking (Jessor, 1987). However, chronically ill adolescents often have to be absent from school or are not able to be involved in club activities because of their health conditions. They are often isolated from their peer group; therefore, alcohol and tobacco use may be an easy way to gain peer acceptance.

Isaji (1996) investigated concerns of 103 families of children and adolescents with chronic illness in Japan. She reported that concerns related to school or school activities were expressed more as the illness duration got longer. One study (Takeda et al., 1997) surveyed 220 chronically ill children and adolescents about their school life in Japan. School absence days among children and adolescents with chronic kidney disease or asthma generally ranged from 1 week to 3 months. Of 220 children and adolescents, 66.8% participate in some type of club activities. Takeda et al. reported that children and adolescents who are not actively involved in club activities tend to have negative feelings toward school life. One study (Nakashima et al., 1994) examined the relationship between stress and social support among 96 adolescents with chronic kidney disease and reported that those who could not attend school activities felt higher stress because of the sense of isolation and felt lower support from their peer and school teachers. Such

feelings related to school attendance and club activity involvement may lead to students engaging in risk behavior (Jessor, 1991; Jessor et al., 1991; Millstein & Igra, 1995). On the other hand, exposure to deviant peer culture through school attendance and club activity involvement may provide the opportunity to engage in risk behavior such as alcohol and tobacco use (Millstein et al., 1993). However, there are few studies that examine the relationships between those variables and risk behavior among chronically ill adolescents.

Illness-Related Characteristics

Children with chronic health conditions have been considered at risk for developmental, behavioral, and psychosocial problems. Factors that may associate with risk behavior and the relationship between illness and risk behavior are discussed.

The Presence of Chronic Illness and Risk Behavior

Many chronic illnesses are associated with chronic or recurrent episodes of pain or acutely diminished or altered physiological function, which may promote anxiety, depression, or altered self-concept (Gortmaker et al., 1990). The presence of a chronic condition may also limit or alter social interactions and distinguish children from their peers, which, in turn, increases the risk of problems with normal psychosocial adjustment. Gortmaker et al. investigated 11,699 children and adolescents with or without chronic conditions, aged 4 to 17 years old, about behavioral problems, including headstrong, antisocial behavior; anxiousness or depression; destructive behavior; peer conflict or social withdrawal; and immature dependency. Substance use was not included

in the category of behavioral problems. In this study, the presence of chronic conditions was significantly related to behavioral problems. Jessor (1991) suggested that various risk behaviors are associated with each other; therefore, behavioral problems caused by the presence of chronic conditions might be related to risk behavior such as alcohol and tobacco use.

Hospitalization, Illness Duration, and Frequency of Clinic Visits

Because chronically ill adolescents require constant medical supervision, often having to visit outpatient clinics or to be hospitalized, illness duration is a significant factor influencing adolescents' daily life. Isaji (1996) investigated 103 families of children and adolescents with chronic illness in Japan. She reported that the most frequent concerns among them were related to illness or medical treatment. Concerns expressed by family members included diagnosis, treatment regimens, prognosis, lack of information, and how to deal with emergency situations. In the nationwide survey (Children and Family Bureau, Japanese Ministry of Health and Welfare, cited in Maeda, 1996) of 3,520 chronically ill children and adolescents, 64.2% reported at least one hospitalization in the past year and 50.6% reported that the length of hospitalization was more than one month.

Takeda et al. (1997) reported that the frequency of clinic visits was most often among children and adolescents with cancer, averaging once a week, and diabetes and most chronic kidney disease required once a month visits. Those adolescents often miss important school events or club activities; therefore, they tend to have the sense of isolation from the peer group (Kanematsu, 1996). For chronically ill adolescents, alcohol

and tobacco use may be easy way to gain peer acceptance. However, there are few studies to report those three variables in relation to alcohol and tobacco use among chronically ill adolescents.

Summary

The literature review focused on risk behavior among Japanese adolescents or chronically ill adolescents. The most frequently used substances for Japanese adolescents are alcohol and tobacco, which are potential threats to their health. Demographic characteristics among Japanese adolescents alcohol and tobacco users indicated that males drank and smoked more than females, and alcohol and tobacco use increased as adolescents aged. Perceived environment, particularly relevant to Japanese adolescents, includes alcohol and tobacco use of their parents and parental norms toward alcohol and tobacco use by their adolescent child. Various studies examined the relationships between substance use and variables related to personality. However, few studies of chronically ill adolescents reported significant relationships. Autonomy and adolescents' attachment to parents may be significantly related to risk behavior of chronically ill adolescents.

Variables related to the behavior domain included in this study are nonadherence, school absence, and club activity involvement. Studies showed that those variables influenced adolescents' daily life; however, there were few studies that examined those variables in relation to risk behavior among chronically ill adolescents. Illness-related characteristics included the duration of illness, frequency of clinic visits, and the hospitalization episodes and were reviewed as the possible variables related to risk behavior.

CHAPTER 3

METHODOLOGY

In this chapter, the design of the study and the sample are described. Protection of human subjects, data collection procedure that were used in this study, and methods of data analysis are discussed.

Design of the Study

A descriptive correlational design was used to examine the relationship of perceived environment, personality, behavior, illness-related characteristics, and selected demographic characteristics of alcohol and tobacco use in chronically ill adolescents. The study was conducted in Japan.

The sample size required for this study was 80 adolescents. The power was calculated by PASS (Hintze, 1991) computer software package. Based on power of .80 and a small effect size in terms of R^2 as low as .16, a significant level of alpha .05 for a multiple regression analysis with 6 combined independent variables, the sample size was calculated to be 80.

Description of the Sampling Procedure and Subjects' Inclusion and Exclusion Criteria

A convenience sample was drawn on the basis of specialty clinic attendance. Clinic personnel, nurses, or physicians screened daily clinic visitors and identified

adolescents who would be eligible to participate in the study. Adolescents were on the list of prospective participants if physicians or nurses indicated these adolescents were physically and mentally able to answer the questionnaire. The investigator checked the list of eligible participants daily. The sampling bias that could occur during screening was explained to physicians and nurses. To reduce the sampling bias, a detailed description of inclusion and exclusion criteria for screening was distributed to clinic nurses and physicians, and they were asked to follow them to minimize sampling bias.

For inclusion in the study, the adolescent was required to have a chronic health condition as indicated by one or more of the following conditions: (a) dependency on medication or special diet for normal function or control of condition; (b) limitation of physical activities appropriate for age and development; (c) need to visit the clinic at least every 6 months; and (d) special ongoing treatments or self-monitoring of disease conditions at home or in school (Stein, 1992). In addition, chronically ill adolescents were required (a) be able to speak, read, and understand Japanese based on the clinic personnel's observations; (b) be a senior high school student between 15 to 18 years of age; (c) not have any referral related to cognitive delay ; and (d) be from a two-parent biological family. As more than 90% of high school students in Japan come from a two-parent family, this criteria was not expected to limit the sample size. The exclusion criteria included the onset of chronic illness within the past 3 months. Individuals who had been diagnosed for less than 3 months were excluded as they might not have fully experienced daily life as chronically ill adolescents.

Protection of Human Subjects

Prior to data collection, a full review form was submitted to and approved by the Institutional Review Board of the University of Alabama at Birmingham (Appendix A). The responsible personnel of each data collection site in Japan approved the study after reviewing the study proposal, including the protection of human subjects. The investigator gave verbal explanations about the study to prospective participants at the clinical sites along with a short form explaining the study. The investigator obtained informal verbal consent before administering the questionnaire. The following points were emphasized: (a) participation was totally voluntary, (b) participation would not affect their care, (c) no compensation would be received by the participants, (d) subjects were free to withdraw from the study at any time, and (e) all respondents would remain anonymous. Because the written consent form for study participation is unusual for the Japanese culture, requiring the written consent form could have decreased subject participation or their willingness to answer honestly. Therefore, verbal consent was obtained from adolescents prior to the data collection. The format for obtaining informed consent appears in Appendix B.

Data Collection Procedures

From the data collection sites, the investigator received permission (a) to access the names, ages, and medical records of participants; (b) to make contact with patients at the outpatient unit; and (c) to administer the set of study instruments at the outpatient unit. The institution director was provided with a letter describing the purpose of the study, the research questions, and the questionnaire.

After appropriate permission was granted, the eligible adolescents were selected following the procedure described above. Before chronically ill adolescents saw their doctors, they usually waited for the results of various tests such as a urine test; the wait was usually as long as 2 hr. The investigator approached the adolescents while they were waiting for those results. If adolescents expressed interest in participating in the study, the investigator showed them the questionnaire and obtained their consent. After getting their verbal consent, the investigator administered the questionnaire at a location in the clinic where the adolescents could have privacy while they answered the questionnaire. The investigator answered any questions from the participants. After the adolescents completed the questionnaire, the investigator looked over the questionnaire to assure that all questions had been answered. Each questionnaire had a code number with no names or other identifying markings. The investigator had a master list containing names and corresponding code numbers. Code numbers were used on the questionnaire to collect data from the medical and nursing records. The master list was destroyed at the completion of the study.

Review of the Instruments

Prior to conducting the pilot study, the instrument packet was reviewed by a panel of three Japanese experts with knowledge of and experience with chronically ill adolescents. A meeting was held to review the questionnaire for the appropriateness, readability, and relevance of the instrument items with chronically ill adolescents. All items of the questionnaire were considered appropriate for the planned subjects. All instruments are summarized and presented in Table 1.

Table 1

Instruments

Domain	Variables	Possible relationships with dependent variables	Number of items	Data type
Dependent Variables				
Risk Behavior	Tobacco Use	--	2	Ordinal
	Alcohol Use	--	1	Ordinal
Independent Variables				
Perceived Environment	Father's use of alcohol	Positive	1	Ordinal
	Mother's use of alcohol	Positive	1	Ordinal
	Total score of parental use of alcohol	Positive	2	Ordinal
	Father's use of tobacco	Positive	1	Ordinal
	Mother's use of tobacco	Positive	1	Ordinal
	Total score of parental use of tobacco	Positive	2	Ordinal
	Parental norm of alcohol use by their adolescents' children	Positive	1	Ordinal
	Parental norm of tobacco use by their adolescents' children	Positive	1	Ordinal
	Total score of parental norms	Positive	2	Ordinal
Personality	Self-reliance	Negative	7	Ordinal
	Attachment to father	Curvilinear?	8	Ordinal
	Attachment to mother	Curvilinear?	7	Ordinal
	Total score of attachment	Curvilinear?	15	Ordinal
Behavior	Adherence	Negative	3	Ordinal
	School absence	Positive	1	Ordinal
	Club activity involvement	Positive	1	Nominal
Illness-Related Characteristics	Illness duration	Positive	1	Interval
	Frequency of clinic visits	Positive	1	Ordinal
	Hospitalization episodes	Positive	1	Ordinal
Demographics	Age	Positive	1	Interval
	Gender	Male	1	Nominal
	Year in school	Positive	1	Ordinal
	Number of older siblings	Positive	1	Interval

Pilot Study

Two pilot studies were conducted. The first study was conducted to determine test-retest reliability and reliability alpha for the questionnaire. A convenience sample of 42 healthy adolescents was recruited from one high school in the suburbs similar to the project setting. The questionnaires excluding illness-related items were administered 2 weeks apart to a sample of healthy adolescents. The test-retest reliability of the questionnaire ranged from .84 to 1.00, except for two items measuring the parental norms (Table 2).

Table 2

Test-Retest Reliability of Major Instruments (N = 42)

Domain	Scale	Number of items	R
Risk Behavior	QF scale (alcohol use)	2	.93
	Tobacco use	1	.98
Perceived Environment System	Fathers' use of alcohol	1	.94
	Mothers' use of alcohol	1	.96
	Fathers' use of tobacco	1	1.00
	Mother's use of tobacco	1	.88
	Parental norm of alcohol use by their adolescent children	1	.61
	Parental norm of tobacco use by their adolescent children	1	.60
Personality System	Autonomy	7	.84
	Attachment to father	8	.89
	Attachment to mother	7	.90

The second pilot study was conducted to evaluate the planned procedures for administration of the instruments and to test the ability of the instruments to obtain the

desired information by observing willingness to complete the questionnaire without any expressions of concerns. Five subjects were recruited by the researcher at a specialty clinic in the general hospital located in a suburban city in eastern Japan. Each adolescent took about 15 to 30 min to complete the questionnaire. All adolescents could answer the items on the questionnaire without any questions. No changes in the data collection procedure and the questionnaire were required.

Instrumentation

The variables of interest in this study and the self-report instruments (Appendix C), which were used to collect data, are described (Table 1). The dependent variables of risk behavior were alcohol and tobacco use by chronically ill adolescents. The independent variables included the following three domains based on Jessor's model: perceived environment system, personality system, and behavior system. The newly added domains were as follows: illness-related characteristics and demographic characteristics. In the perceived environment system, alcohol and tobacco use of parents and parental norms of alcohol and tobacco use by their adolescent children were included. In the personality system, variables included autonomy and adolescents' attachment to parents. Adherence to the prescribed regimen, school absence, and club activity involvement were included in the behavior system. The domain, illness-related characteristics, included the duration of illness, the frequency of clinic visits, and hospitalization episodes. Demographic characteristics included age, gender, and the number of older siblings.

Risk Behavior

Risk behavior in this study included alcohol and tobacco use by Japanese adolescents with chronic kidney disease. The instruments used to assess alcohol and tobacco use are discussed in the following sections.

Alcohol use. Alcohol use was measured by the Quantity-Frequency (QF) Scale (Suzuki, Matsushita, Higuchi, & Takeda, 1994). The QF Scale was developed to identify problem drinking in adolescents. It is a 4-point Likert scale that contains two items. One item measures quantities that adolescents drink, and the other item measures drinking frequencies. The score of quantity of alcohol per occasion ranges from 0 to 3. The score 0 means that adolescents never drink alcohol or they have one drink or less than one drink per occasion. The frequency of drinking occasions are scored from 0 to 3. The score 0 means that the adolescent drinks none or little. The score 3 means that adolescents drink several times or more a week. The sum of the quality and frequency scores indicate the degree of adolescents' problem drinking. The summed score ranges from 0 to 6: (a) normal nondrinking adolescents' score is 0, (b) a drinker scores 1 to 3, and (c) the problem drinker scores 4 to 6 (Suzuki et al.).

The QF Scale has two items that were from the original screening instrument, the 14-item Adolescents Alcohol Involvement Scale (AAIS; Mayer & Filstead, 1979). Suzuki et al. (1991) translated the AAIS into Japanese and tested it with 1,062 Japanese second-year high school students. They also surveyed the drinking behavior of 14,438 Japanese high school students from nine prefectures (Suzuki et al., 1994). Based on this study, they developed the QF Scale by choosing the items most predictive of drinking

behavior of adolescents rather than administering all the items of AAIS. The QF Scale was validated by examining the correlation with the AAIS (Suzuki et al, 1994). The normal adolescents predicted by the QF Scale included 99.7% of abstainers and 95% of normal adolescents as identified by AAIS. The drinkers identified by the QF Scale were 62% overlapped by nonproblem drinkers as identified by the AAIS. The problem drinking subjects as identified by the QF Scale contained 69% of alcohol misusers and 95% of alcoholic-like drinkers identified by the AAIS. Three types of adolescent drinkers identified by the QF Scale were further examined by four items of AAIS scale: (a) effects of alcohol, (b) reasons for drinking, (c) drinking buddies, and (d) kinds of alcohol in high school students. The distribution on answers to these four items among the three groups identified by the QF Scale (i.e., normal adolescents, drinker, and problem drinker) were similar to the distribution of AAIS categories. Test-retest reliability of the QF-scale in the pilot study was .9341 (Table 2).

Tobacco use. Tobacco use in adolescents was measured by one item from the Japan Know Your Body (JKYB) questionnaire, which was developed to measure the smoking behavior of adolescents. The item was selected from the Japan Adolescents' Smoking Survey (JASS), which contains various items related to tobacco use by adolescents. This item asks adolescents about tobacco use in the past month. The multiple-choice answer is used to define their tobacco use.

In this study, the quantity score of cigarettes smoked in the past month ranged from 1 to 4: (a) a score of 1 means there was no smoking, (b) a score of 2 means one cigarette was smoked, (c) a score of 3 means between 2 to 19 cigarettes were smoked,

and (d) a score of 4 means twenty or more cigarettes were smoked. Kawabata et al. (1991b) argued that asking adolescents the number of cigarettes they have smoked in the past week or month encouraged adolescents to answer inaccurately. It was stated that the categorical response format of the JKYB was more suitable and valid for adolescents (Kawabata et al., 1991b; M. Nakamura, 1996a, 1996b). Watanabe (1996) used two kinds of questionnaires with 3,681 subjects aged 9 to 18 years to test the reliability of the JASS questionnaire. The agreement of reported use of tobacco in the past week and in the past month was 97.3% to 100%. M. Nakamura (1996b) also questioned 146 high school students to study the reliability of items of the JASS related to tobacco use. Parallel-forms reliability was supported; the agreement rate between selected items of tobacco use and other items was 96.6% and the k-statistic (interobserver agreement) was 0.93.

Concurrent validity of this questionnaire was obtained by comparing reported tobacco use on the questionnaire with the nicotine level in saliva (M. Nakamura, 1996b). High school students were asked to complete the JASS and to submit saliva samples at the same time. The compatibility of the self-report questionnaire and saliva assays were 98% for nonsmokers and 90% for smokers. Of self-reported smokers, 10% were not identified as smokers because they smoked occasionally. It was assumed that passive smoking might increase the nicotine level in the saliva of nonsmokers. M. Nakamura concluded that the validity of the self-report questionnaire was adequate. Test-retest reliability of adolescent smoking item was .98 (Table 2).

Perceived Environment

Variables in this domain included parental use of alcohol, parental use of tobacco, and parental norms of alcohol and tobacco use. The instruments are discussed in the following sections.

Parental use of alcohol. Parental use of alcohol was measured by one item on a 3-point Likert scale from Suzuki's (1993) study: (a) don't drink, (b) drink sometimes, and (c) drink everyday. Suzuki's (1993) original study did not specify the score for each item. In this study of Japanese chronically ill adolescents, the score ranged from 2 to 6. A higher score indicates a more risky environment for adolescents' alcohol use (Suzuki, 1993). This scale was tested in 1,062 high school students to examine the relationship between parental alcohol use and adolescent drinking behaviors measured by the AAIS (Suzuki et al., 1991). ANOVA revealed that the AAIS scores were significantly higher among adolescents whose parents drank alcohol every day than of those who did not drink alcohol. The pilot study showed that test-retest reliability of the father's drinking item was .9415 and the mother's drinking item was .9617 (Table 2).

Parental use of tobacco. Two items from the JKYB study were used to measure parental use of tobacco. Each item has four choices: (a) none, (b) quit smoking, (c) smoker, and (d) don't know. In this study of chronically ill adolescents, choices (a), (b), and (d) are scored 1, and choice (c) is scored 2. A higher score indicates more risk for adolescent tobacco use. Kawabata et al. (1991a) used the JKYB questionnaire to investigate tobacco use and reported parental tobacco use in 12,892 Japanese children

and adolescents age 8 to 18 years. A chi-square test revealed that the smoking rate of children and adolescents whose parents smoked was significantly higher than those whose parents did not. The content validity of this questionnaire was reported as adequate by M. Nakamura (1996b). Reliability was not reported. Test-retest reliability in the pilot study showed that the father's use of tobacco item was .7956 and the mother's one was .6659 (Table 2).

Parental norms of alcohol and tobacco use. Parental norms on alcohol and tobacco use were measured by using two items based on Ohstu's (1989) study. These items ask how adolescents perceive parental norms toward the adolescents' use of alcohol and tobacco. Ohtsu (1989) investigated the relationship between parental norms and drinking behavior among junior and senior high school students. He reported that parental norms were significantly less strict in alcohol drinkers than in nondrinkers. The reliability of this scale was not reported. The content validity of this item was supported by Kojima et al. (1997). Kojima et al. studied alcohol use of 604 high school students in terms of parent-adolescent relationships. The questionnaire contains Ohtsu's item. As Ohtsu's study showed, parental norms of alcohol use by adolescents were most significantly related to adolescents' frequency of alcohol use. Based on these two studies, a multiple choice response format was used for this study. It includes the following answers: (a) I should not drink, (b) I can drink only for a special occasion, (c) I can drink if it is a little, (d) My parents are not interested in their children's drinking, and (e) other. The choice (a) is scored 1, and the other four choices are scored 2. A lower score means

more strict norms by parents about alcohol use. The same choice format and scoring method were used for tobacco use. The total score ranged from 2 to 4.

Personality

Autonomy and emotional attachment to parents were measured in the personality domain. It is noted that autonomy can only be achieved in the context of a secure attachment and supportive relationship with parents. Self-reliance is the operationalization of autonomy (Onodera, 1993). Two instruments of Self-Reliance and Emotional Attachment to Parents were developed by Onodera (1993); she administered them to 354 Japanese college students whose average ages were 21.1 years in males and 19.9 years in females and 313 American college students whose average ages were 20.1 years in males and 19 years in females.

Self-Reliance Scale. The Self-Reliance Scale by Onodera (1993) was used to measure one dimension of adolescents' autonomy. The self-reliance scale was derived from Kato and Takagi (1980), who developed an adolescent autonomy scale to identify the developmental stages of autonomy from early to late adolescence. This scale consists of 20 items and is a 5-point Likert scale. It has three subscales: adolescent autonomy, dependence on parents, and resistance and internal confusion. This instrument was tested on 1,055 Japanese adolescents aged 12 to 22 years. Reliability and validity were reported as adequate by the authors.

Onodera (1993) completed a factor analysis of this scale and reduced it to a 7-item scale by eliminating items with low factor loading scores. Reviewing these items,

she relabeled it a self-reliance scale. In this scale, subjects are asked to choose how various statements (i.e., I can solve my own problems I may face in my life; I can decide my future goal or career by myself) describe their confidence in themselves. The 5-point rating scale ranges from strongly disagree to strongly agree. Scores range from 7 to 35. A higher score indicates more self-reliance. Internal consistency reliability of new self-reliance scale was a Cronbach alpha of .728. Test-retest reliability of self-reliance scale in the pilot study was .8395 (Table 2).

Adolescent Emotional Attachment to Parents Scale. Emotional attachment was measured by Onodera's (1993) Emotional Attachment Scale. A benefit to the use of this scale is that it asks adolescents about their attachment to father and mother separately rather than asking adolescents about their parents as a set. Onodera reported there are differences about the level of adolescents' attachment depending on the gender of their parents. Onodera chose 12 items from the Blocks' California Child Q-set (Block & Block, 1980 cited in Onodera, 1993); she also developed 5 items related to the parent-adolescent relationship. She administered this 34-item questionnaire to 667 college students from the United States and Japan. She completed the factor analysis and reduced it to 15 items, which are named the Emotional Attachment to Parents Scale. This 5-point Likert scale measures adolescents' emotional attachment to their parents. In this scale, subjects are asked to choose statements that best describe how their parents (e.g., When I was a child, my father played with me well). The 5-point rating scales ranges from very uncharacteristic to very characteristic. Scores range from 15 to 75 for the total test score. A higher score indicates more attachment to parents. The emotional attachment to father

scale contains 8 items. The internal consistency reliability alpha is .781. Test-retest reliability in the pilot study was .8944 (Table 2). The emotional attachment to mother scale contains 7 items, and Cronbach alpha is .734 (Onodera, 1993). Test-retest reliability in the pilot study was .8957 (Table 2). Consistant validity was obtained to determine the association with Takahashi's (cited in Onodera, 1993) attachment scale ranged from .212 to .473.

Behavior

Variables in this domain included adherence to the prescribed regimen, school absence, and club activity involvement. Instruments are discussed in the following sections.

Adherence to the prescribed regimen. Kanematsu (1996) developed a self-care questionnaire for various chronically ill children and adolescents aged 11 to 18 years. Nakashima et al. (1994) used this questionnaire with 47 adolescents with chronic kidney disease to investigate their self-care behavior and its relationship to stress and social support. Three items related to adherence were included in this questionnaire: (a) taking prescribed medicine, (b) following activities, and (c) diet restriction. Each regimen has a 3-point rating scale: (a) I always follow, (b) I sometimes follow, and (c) I rarely follow. Each score is divided by 3 so that it ranges from 0.33 to 1. Because some adolescents did not have all three prescribed regimens, the total score was divided by the sum of the number of prescribed regimens. If the adolescent endorsed all three items, prescribed medicine, activity restriction, and diet restriction, the total score was divided by 3.

Therefore, total scores range from 0.11 to 1, regardless of the number of prescribed regimens. A lower score indicates nonadherence. The internal consistency reliability of those three items was .68 for 26 children with epilepsy and .69 for 47 children with chronic kidney disease. The content validity of these items was reviewed by a panel of child nursing experts and reported as adequate (Kanemastu, 1996).

School absence. School absence was measured by one item, "How often were you absent from school or work in the past year?" Because chronically ill adolescents are required to visit the clinic during weekdays, most of them are absent from school either during the morning or afternoon. Such adolescents tend to calculate these days of absence as half days. To determine days of school absence as accurately as possible, it was more accurate to ask about absence days in the following categories: (a) 1 week, (b) 1 week to 1 month, (c) 1 month to 3 months, and (d) more than 3 months. This item has been used in many studies related to chronically ill children and adolescents aged 11 to 18 years (Kanematsu, 1996; Nakashima et al., 1994; Uchida et al., 1994). The content validity of this item was reviewed by an expert panel in the area of pediatric health care (Takeda et al., 1997).

Club activity involvement. Club activity involvement was measured by one item. This item has been used in studies of children and adolescents with various chronic conditions aged 11 to 18 years. (Kanematsu, 1996; Nakashima et al., 1994; Uchida et al., 1994). The content validity was determined by a panel of child nursing experts (Kanematsu, 1996).

Illness-Related Data

Illness-related data were collected to describe the sample and to determine the influence of the illness-related conditions on alcohol and tobacco use in chronically ill adolescents. To determine disease duration as accurately as possible, the date of diagnosis was obtained by reviewing medical records. Functional status affected by chronic illness was also measured with items including frequency of hospital visits and number of hospitalization episodes in the past year as by determined by self-report. To describe the adolescents' illness condition in detail, the prescribed treatment regimen including medications, restriction of activities, and diet regimen was obtained by reviewing medical records.

Demographic Characteristics

Demographic data were collected to describe the sample and to determine the influence of demographic characteristics on alcohol and tobacco use among chronically ill adolescents. Data were collected on date of birth, grade in school, gender, and number of older siblings.

Data Analysis Plan

The Statistical Package for the Social Sciences (SPSS) was used for analyzing data in this investigation. After data were entered into a data file, editing was performed. The control of accuracy was determined by edits performed for allowable values. The internal consistency reliability alpha was calculated for each of the instruments.

Descriptive statistics were used to describe club activity involvement, the illness-related characteristics, and demographic characteristics and to answer the first research question. School absence, club activity involvement, frequency of clinic visits, hospitalization episodes, gender, and number of older siblings were reported by frequencies and percentages. Illness duration and age were reported by means, ranges, and standard deviations. To answer the first research question, frequencies and percentages were used to describe alcohol and tobacco use. Regarding alcohol use, range, median, mean, and standard deviation were used to describe the overall score of the QF Scale.

Stepwise multiple regression analysis was used to answer the other research questions and to test the sixth hypothesis regarding whether there is a relationship between chronically ill adolescent alcohol and tobacco use and the perceived environment system (parental use of alcohol and tobacco and parental norms of alcohol and tobacco use by their adolescent children), the personality system (self-reliance and attachment to parents), the behavior system (nonadherence, school absence, and club activity involvement), the illness-related characteristics (illness duration, frequency of clinic visits, and hospitalization episodes), and the demographic characteristics (age, gender, and number of older siblings). The QF Scale and one item of tobacco use were the dependent variables. The variables in the following five domains served as independent variables: the perceived environment system, the personality system, the behavior system, illness-related characteristics, and demographic characteristics.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

Chapter 4 presents the analysis and results of the statistical data used to answer the research questions presented in chapter 1.

Description of the Sample and the Study Sites

The sample consisted of 80 adolescent patients recruited from three specialty clinics for pediatric kidney disease. Two of three clinics were located in a suburban city in eastern Japan. One clinic was in a general hospital that had two long-term care units for pediatric kidney disease. This hospital also had a special school for 1st to 15th graders who required long-term hospitalization. The second clinic was in a children's hospital that provides mainly tertiary care. The third clinic was in a private university hospital with a transplantation center, and it was located in a metropolitan area. Each of three clinics had physician specialists in the area of pediatric kidney disease. The questionnaires were distributed over 8 months to 107 patients who were potential participants and who were selected by the clinic personnel or the investigator by reviewing medical records. There were two adolescents who refused to participate in this study because of their visiting schedule in other clinics. Of the returned questionnaires, 80 were usable (74.8%). The majority of these adolescents ($n = 67$, 83.8%) were recruited from a clinic in the general hospital of a suburban city. Ten adolescents were recruited from a clinic in

a private university, and three were recruited from a children's hospital. Questionnaires (n = 27) were excluded because they did not meet the study criteria. These included 13 adolescents who were from single-parent families (48.1%) and 8 adolescents who did not have prescribed medication (29.6%). Marital status was usually asked at the time of the first hospital admission by medical personnel; however, changes of marital status, such as divorce, were rarely reported by families. Therefore, information about such changes was not available by reviewing medical records. Eight adolescents who did not have prescribed medications were included as subjects because they required clinic visits and regular check ups. However, since most of them had genetic diseases, physicians recommended excluding these adolescents. The restrictions of daily life for these adolescents were minimal. Thus, they were similar to healthy adolescents and different from the subjects of this study.

Descriptive Statistics for Major Study Variables

In this section, major study variables in the five domains are presented: (a) perceived environment system, (b) personality system, (c) behavior system, (d) illness-related characteristics, and (e) demographic characteristics.

Perceived Environment System

Table 3 presents parental use of alcohol and tobacco. The majority of fathers (n = 49, 61.3%) smoked tobacco compared with about one fifth (n = 17, 21.3 %) who did not. Only 15% (n = 12) of fathers did not drink alcohol.

Parental norms about alcohol and tobacco use by their adolescent children are presented in Table 3. For alcohol use, the most frequent answer was that parents think

Table 3

Parental Use of Alcohol and Tobacco and Parental Norms Toward Alcohol and Tobacco Use by Their Adolescents Children (N = 80)

Variable	N	%
Father's use of tobacco		
Don't smoke	17	21.3
Used to smoke	12	1.0
Smoke	49	61.3
Do not know	2	2.5
Mother's use of tobacco		
Don't smoke	56	70.0
Used to smoke	8	10.0
Smoke	16	20.0
Father's use of alcohol		
Don't drink	12	15.0
Sometimes	36	45.0
Everyday	32	40.0
Mother's use of alcohol		
Don't drink	26	32.5
Sometimes	49	61.3
Everyday	5	6.3
Parental norm alcohol		
Should not	13	16.3
Only for a special occasion	10	12.5
Can drink if it is little	31	38.8
Not interested in	11	13.8
Other	15	18.8
Parental norm tobacco		
Should not	43	53.8
Only for a special occasion	0	0.0
Can smoke if it is little	7	8.8
Not interested in	13	16.3
Other	17	21.3

adolescents can drink in small amounts (n = 31, 38.8%). The second most frequent answer was "other" (n = 15, 18.8%). Only 13 adolescents (16.3%) answered that their parents think adolescents should not drink alcohol (Table 3). Forty-three adolescents (53.8%) answered that their parents think adolescents should not use tobacco. Once again, the second most frequent answer was "other" (n = 17, 21.3%). Only 7 (8.8%) answered that their parents think adolescents can smoke if "it is little" (Table 3).

Personality System

Cronbach's alphas for autonomy, attachment to father, attachment to mother, and the total score of attachment were .584, .789, .751, and .835, respectively. Means, standard deviations, and ranges for the Self-Reliance Scale and Adolescent Emotional Attachment to Parents Scale are presented in Table 4. Mean scores of attachment were 24.65 for mother's attachment (n = 80, SD = 5.45) and 25.58 for father's attachment (n = 79, SD = 6.47). The mean of the Self-Reliance Scale was 24.12, with a standard deviation of 4.13.

Table 4

Descriptive Statistics for Autonomy and Attachment (N = 80)

Instruments		M	SD	Min	Max	n
Autonomy		24.12	4.13	15.0	34.0	78
Attachment to	Father	24.65	5.45	10.0	35.0	80
	Mother	25.58	6.47	8.0	38.0	79
	Total	50.16	10.36	25.0	73.0	79

Behavior System

Descriptive statistics for school absence and club activity involvement are presented in Table 5. For the majority of adolescents (n = 76, 95.0%), days of school absence were no more than 30 days a year. However, only one third (n = 26, 32.5%) of adolescents were involved in regular club activities. Of 26 adolescents, only 7 (8.8%) attended sports-oriented activities.

Table 5

Descriptive Statistics for School Absence and Club Activity Involvement (N = 80)

Variable	n	%
School absence in the past year		
Within a week	50	62.5
One week to one month	26	32.5
Up to three months	4	5.0
Club activity involvement		
Sports oriented	7	8.75
Culture oriented	19	23.75
None	54	67.50

Table 6 describes the frequency of adherence. Of 80 adolescents, less than 10% were "never" adherent in all of the areas of regimens related to diet, activity, and medication intake.

Table 6

Descriptive Statistics for Adherence to the Prescribed Regimen (N = 80)

Variable	n	%
Diet		
Always follow	27	33.8
Sometimes	24	30.0
Never	5	6.3
Not prescribed	24	30.3
Activity		
Always follow	35	43.8
Sometimes	24	30.3
Never	6	7.5
Not prescribed	15	18.8
Medication		
Always follow	54	67.5
Sometimes	20	25.0
Never	6	7.5
Not prescribed	0	0.0

The adherence score of each prescribed regimen and the total score are presented in Table 7. Medication has the highest mean score. The lowest mean score was found in diet adherence.

Table 7

Descriptive Statistics for Adherence Score (N = 80)

Variable	M	SD	Min	Max	n
Diet	.7976	.2172	.33	1.00	56
Activity	.8125	.2212	.33	1.00	64
Medication	.8667	.2095	.33	1.00	80
Total	.8313	.1758	.33	1.00	80

Illness-Related Characteristics

Table 8 describes the diagnostic name, and treatment regimens related to diet, activity, and number of prescribed medicines. Sixty-six percent of the adolescents were diagnosed with chronic nephritis, most of them with IgA nephritis. The range of illness duration was from 1 year to 15 years with a mean 5 years and 4 months (M = 64.6, SD = 33.59).

Table 8

The Diagnostic Name, Treatment Regimen, and Number of Prescribed Medications (N = 80)

Diagnosis	n	%
Chronic Nephritis	53	66.3
Nephrosis	11	13.8
SLE/Purpra Nephritis	10	12.5
Other	6	7.5

Variable	n	%
Adolescents who are prescribed diet regimen	56	70.0
Adolescents who are prescribed activity restriction	65	81.3
Adolescents who are prescribed medication	80	100.0

Variable	M	SD	Min	Max
Number of prescribed medications	3.09	1.68	1	9

Note. SLE = systematic lupus elitematodes.

Table 9 contains information about hospital admissions and the purposes of admission and frequency of clinic visits within the past year. The majority of adolescents came to the specialty clinic once a month. Of 21 adolescents, 26.3% were admitted to

Table 9

Descriptive Statistics of Illness Duration, Clinic Visit and Hospitalization Episodes in the Past Year (N = 80)

Variable	M	SD	Min	Max
Illness duration (months)	64.63	33.59	12.0	184.0

Variable	n	%
Frequency of clinic visit in the past year		
Once a week	1	1.3
Every two weeks	4	5.0
Once a month	71	88.8
Once in 6 weeks to 2 months	4	5.0
The reasons of hospitalization		
Kidney biopsy	13	16.3
Condition gets worse	7	8.8
Other	1	1.3
No hospitalization	59	73.8

the hospital in the past year, and 13 adolescents (16.3%) were hospitalized for a kidney biopsy as the treatment evaluation.

Demographic Characteristics

In this section, demographic characteristics of the five domains are presented. The demographic characteristics of the chronically ill adolescents included the following variables: age, gender, school year, and numbers of siblings (Table 10). The adolescents ranged in age from 15 to 18 years, with a mean age of 16.7 years (SD = .88). Fifty-five percent (n = 44) of subjects were male. All adolescents were senior high school students, and 30 adolescents (37.5%) were in the sophomore year.

Table 10

Demographic Characteristics of Adolescents with Chronic Kidney Disease (N = 80)

Variable	M	SD	Min	Max
Adolescent age	16.69	.88	15	18
Number of siblings	1.31	.76	0	4
Number of older siblings	.74	.69	0	2

Variable		n	%
Gender	Male	44	55.0
	Female	36	45.0
School year	Junior	29	36.3
	Sophomore	30	37.5
	Senior	21	26.3

Findings Related to the Research Questions

This section presents the results of the data analysis related to the six research questions.

Research Question 1: What is the frequency of alcohol and tobacco use among Japanese adolescents with chronic disease?

The Risk Behavior QF Scale is concerned with the quantity of alcohol per occasion and the frequency of alcohol intake by adolescents with chronic kidney disease. Descriptive statistics of alcohol use as indicated by the QF Scale are presented in Table 11. Most adolescents reported they did not drink alcohol or they drank once or twice a year (n = 62, 77.5%). In terms of the quantity of alcohol intake per occasion, 76.3% (n = 61) of the adolescents reported they drank less than one drink; 19 adolescents (23.9%) reported they drank more than two drinks. Of 19 adolescents, 5 (6.3%) reported they

Table 11

Descriptive Statistics of Alcohol Use Measured by QF Scale (N = 80)

Variable	n	%	Score for QF scale
Quantity			
Never and 1 drink or under	61	76.3	0
2 drinks	5	6.3	1
3 to 6 drinks	9	11.3	2
6 or more drinks	5	6.3	3
Frequency			
Never and once or twice a year	62	77.5	0
Once or twice a month	11	13.8	1
Once a week	5	6.3	2
Several times or more a week	2	2.5	3

Variable	n	%	Score range of QF scale
Degree of alcohol use defined by QF score			
Normal adolescents	55	68.8	0
Drinker	20	25.0	1-3
Problem drinker	5	6.2	4-6

Instrument	M	SD	Min	Max
QF score	.81	1.42	0	6

drank alcohol until they got drunk. According to the score, 55 adolescents (68.8%) were categorized as "normal," 20 (25%) adolescents as "drinker," and 5 (6.2%) as "problem drinker." The mean score of the QF Scale was .81 (SD = 1.42).

Table 12 presents descriptive statistics of tobacco use by adolescents with chronic kidney disease. Sixty-eight adolescents (85.0%) did not use tobacco; 8 (10.0%) reported they smoked 2 to 19 cigarettes in the past month, and 4 (5.0%) reported they smoked more than 20 cigarettes in the past month. Of the 12 adolescents who reported using tobacco, only 3 were female. The mean score of tobacco use was 1.35 (SD = .86). A

Table 12

Descriptive Statistics of Tobacco Use (N = 80)

Variable	n	%	Score
Tobacco use			
Don't smoke	68	85.0	1
One cigarette	0	0.0	2
2-19 cigarettes	8	10.0	3
More than 20 cigarettes	4	5.0	4

Variable	M	SD	Min	Max
Tobacco score	1.35	.86	1	4

Kruskal Wallis test showed no significant differences in alcohol and tobacco use by clinic settings.

Research Question 2: Are the following aspects of the adolescents' perceived environment system (parental use of alcohol and tobacco and parental norms of alcohol and tobacco use by their adolescent children) associated with chronically ill adolescents' risk behaviors of alcohol and tobacco use?

Table 13 shows Spearman's correlation coefficients of variables in the perceived environment system with the QF score. Father's use of tobacco had the highest positive correlation coefficient with QF score ($R = .3643$, $P < .01$). Father's use of alcohol and the parental norm of alcohol and tobacco use by their adolescent children were also significantly and positively correlated with the QF score (Table 13).

A stepwise multiple regression analysis was used to determine the relationship of the independent variables from the perceived environment domain with alcohol use measured by the QF score. The independent variables were father's and mother's use of alcohol, father's and mother's use of tobacco, and the parental norm about alcohol use and

Table 13

Spearman Correlation Coefficients Between Alcohol and Tobacco Use by Adolescents and Variables in the Perceived Environment System (N = 80)

Variable	Tobacco use by adolescents	Alcohol use by adolescents
Alcohol use		
Father	.13	.24*
Mother	.07	.14
Parents	.13	.24*
Tobacco use		
Father	.20	.36**
Mother	.07	.09
Parents	.17	.32**
Parental Norm		
Toward alcohol use by their adolescent children	.18	.22*
Toward tobacco use by their adolescent children	.19	.26*
Toward alcohol and tobacco use by their adolescent children (summed score of parental norm)	.22	.29*

Note: "Parents" is summed score of father and mother.
*$p < .05$. **$p < .01$.

tobacco use by their adolescent children. The removal criterion for each independent variable was the maximum probability of F-to-remove; it was significant at the .05 level.

The variable, father's use of tobacco, was the only predictor entered in the first step. This variable had the highest bivariate correlation with adolescents' alcohol use. With the variable father's use of tobacco used to predict adolescents' alcohol use, the adjusted R^2 was .097. The overall F (1, 78) of 9.518 was significant at the .01 level. The b weight of the variable father's use of tobacco was significant ($t = 3.085$, $P = .003$). Therefore, the second step of regression analysis was not performed. Within the variable

of perceived environment, only father's use of tobacco had a significant positive relationship with adolescents' alcohol use (Table 14).

Table 14

Summary of Multiple Regression Analysis for Variables in the Perceived Environment System Predicting Alcohol Use (N = 79)

Variable	B	SE B	β
Father's use of tobacco	.958	.310	.330*
R	.330		
R-squared	.109		

*p < .01.

The stepwise multiple regression was used to determine the relationship of the same independent variables with tobacco use. The variable, parental norms about alcohol and tobacco use by their adolescent children, was the only predictor entered in the first step. With the variable of parental norms used to predict adolescents' tobacco use, the adjusted R^2 was .042. The overall F (1, 78) of 4.4454 was significant at the .05 level. The b weight of the variable father's use of tobacco was significant (t = 2.110, P = .038). Therefore, the second step of regression analysis was not performed. Within the variable of perceived environment, only parental norms about alcohol and tobacco use by their adolescent children had a significant positive relationship with adolescents' tobacco use (Table 15).

Research Question 3: Are the following aspects of the personality system (autonomy and attachment to parents) associated with chronically ill adolescents' risk behaviors of alcohol and tobacco use?

Table 15

Summary of Multiple Regression Analysis for Variables in the Perceived Environment System Predicting Tobacco Use (N = 79)

Variable	B	SE B	β
Parent norm about alcohol and tobacco use by their adolescent children	.271	.128	.232*
R	.232		
R-squared	.054		

*p < .05.

There was no association between variables in the personality system and risk behaviors. The overall scores of attachment and autonomy were not related to alcohol and tobacco use. Stepwise multiple regression did not show any significant variables to predict alcohol and tobacco use by using variables in the personality system.

Research Question 4: Are the following aspects of the behavior system (adherence, school absence, and club activity involvement) associated with chronically ill adolescents' risk behaviors of alcohol and tobacco use?

Table 16 shows Spearman's correlation coefficients of variables in the behavior system with the QF score. Adherence to the diet and activity regimens had positive correlation coefficients with the QF score (R = .477, P < .01; R= .278, P <.05). The total score of adherence was significantly and negatively correlated with the QF score. (Table 16).

In the stepwise multiple regression, the three independent variables, school absence, club activity involvement, and the total score of adherence, were used to predict the dependent variable of alcohol use measured by the QF score. Adherence scores of each regimen were not used because some adolescents were not prescribed all three

Table 16

Spearman Correlation Coefficients Between Alcohol and Tobacco by Adolescents and Variables in the Behavior System (N = 80)

Variable	Tobacco use by adolescents	Alcohol use by adolescents
Adherence		
Diet	.08	.48**
Activity	.11	.24
Medication	.13	.28*
Total score of adherence	-.11	-.39**
School absence	.13	.12
Club activity involvement	.19	-.06

*p < .05. **p < .01.

regimens, and entering those variables resulted in reducing the number of subjects in the multiple regression. Table 17 shows that adherence accounted for 9.1% of the variance in QF score. The overall F (1, 78) of 7.839 was significant at the .01 level. A multiple correlation of .302 demonstrated a weak relationship between adherence and adolescents' alcohol use.

Table 17

Summary of Multiple Regression Analysis for Variables in the Behavior System Predicting Alcohol Use (N = 79)

Variable	B	SE B	β
Adherence score	-2.448	.874	-.302*
R	.302		
R-squared	.091		

*p < .01.

Stepwise multiple regression was performed to predict adolescent tobacco use with the independent variables of school absence, club activity involvement, and adherence. Table 18 shows that adherence and club activity involvement accounted for 8.9% of the variance in tobacco use. Club activity involvement was positively related to tobacco use and adherence was negatively related to it. The overall F (2, 77) of 3.738 was significant at the .05 level. A multiple correlation of .297 shows weak relationship between adherence and adolescents' alcohol use.

Table 18

Summary of Multiple Regression Analysis for Variables in the Behavior System Predicting Tobacco Use (N = 79)

Variable	B	SE B	β
Adherence score	-1.271	.551	-.260*
Club activity involvement	.415	.205	.228*
R	.297		
R-squared	.089		

*p < .05.

Research Question 5: Are the following aspects of the illness-related characteristics (illness duration, frequency of clinic visits, and hospitalization episodes) associated with chronically ill adolescents' risk behaviors of alcohol and tobacco use?

There was no association between independent variables in the illness-related characteristics and risk behavior. None of three independent variables, illness duration, frequency of clinic visits, and hospitalization episodes, were related with alcohol and tobacco use. Stepwise multiple regression failed to show any relationship between three

independent variables in the illness-related characteristics and risk behavior of alcohol and tobacco use.

Research Question 6: Are the following demographic characteristics (age, gender, year in school, and number of older siblings) associated with chronically ill adolescents' risk behaviors of alcohol and tobacco use?

Spearman's R showed that there was a significant negative relationship between gender and adolescent tobacco use. Male adolescents used tobacco significantly more than females ($R = .312$, $P < .01$). In stepwise multiple regression, the four independent variables, age, gender, year in school, and number of older siblings, were used to predict the dependent variable of adolescents' tobacco use. The combination of these four variables explained 9.8% of the variance in adolescents' tobacco use. The overall $F(1,78)$ of 8.427 was significant at the alpha level of .01. Gender was the only variable to enter the regression equation (Table 19). In stepwise multiple regression, the dependent variables of the QF scores failed to be predicted by four variables from demographic characteristics.

Table 19

Summary of Multiple Regression Analysis for Variables in the Demographic Characteristics Predicting Tobacco Use (N = 79)

Variable	B	SE B	β
Gender	-.535	.184	-.312*
R	.312		
R-squared	.098		

*$p < .01$.

Research Question 7: How much variability in chronically ill adolescents' risk behavior can be explained by selected variables within the five domains of perceived environment system, personality system, behavior system, illness-related characteristics, and demographic characteristics?

A stepwise multiple regression analysis was used to determine the relationship of the independent variables with QF scores. The QF score was used as the dependent variable. The stepwise multiple regression was performed with all independent variables from the five domains, perceived environment system, personality system, behavior system, illness-related characteristics, and demographic characteristics. All independent variables were selected to find the optimal combination of those variables for predicting the dependent variables.

Table 20 shows that 30.2% of the variance in the QF scores for alcohol use was accounted for by the combined influence of adherence, father's tobacco use, father's use of alcohol and frequency of clinic visits. The overall F (4, 72) of 7.785 was significant at the .001 level. A multiple correlation of .579 indicated a relationship among the predictor variables and the criterion variable of the QF score for alcohol use.

A stepwise multiple regression analysis was used to determine the relationship of the selected independent variables with adolescents' tobacco use. Table 21 shows that 7.8% of the variance in adolescent tobacco use was accounted for gender. The overall F (1, 75) of 6.327 was significant at the .05 level.

Table 20

Summary of Multiple Regression Analysis for Variables in All Domains Predicting Alcohol Use (N = 79)

Variable	B	SE B	β
Step 4			
Adherence	-2.655	.785	-.339**
Frequency of clinic visit	.702	.328	.212*
Father's use of alcohol	.396	.186	.213*
Father's use of tobacco	.667	.266	.251*
R	.549		
R-squared	.302		

*p < .05. **p < .01

Table 21

Summary of Multiple Regression Analysis for Variables in All Domains Predicting Tobacco Use (N = 76)

Variable	B	SE B	β
Gender	-.443	.176	-.279*
R	.279		
R-squared	.078		

*p < .05.

Summary

Descriptive statistical analysis was used to examine alcohol and tobacco use of chronically ill adolescents and the major study variables. Test-retest reliability for the study instruments was calculated. A Spearman product moment correlation matrix containing the major study variables was generated and used to test the direction and

strength of the relationships of the major study variables to alcohol and tobacco use of chronically ill adolescents.

A stepwise multiple regression was computed with scores on the QF Scale as the dependent variable. A multiple correlation coefficient of .549 demonstrated a relationship of alcohol use with the following four independent variables: father's use of tobacco, father's use of alcohol, nonadherence, and frequency of clinic visit. These variables were significantly related to the QF score for adolescent alcohol use. In combination, these four variables explained 30.2% of the variance in QF scores.

The same analysis was performed to predict chronically ill adolescents' tobacco use. Only adolescent gender demonstrated a relationship with adolescent tobacco use. Gender accounted for 7.8% of the variance in adolescent tobacco use ($\underline{R} = .279$).

CHAPTER 5

DISCUSSION

The purpose of this study was to ascertain the determinants of alcohol and tobacco use by chronically ill adolescents. The sample included 80 adolescents aged 15 to 18 years recruited from specialty clinics in Japan for pediatric chronic kidney disease. The conceptual framework of this study was derived from Jessor's (1991) problem behavior theory. Risk behaviors included in this study were alcohol and tobacco use. The dependent variables were divided into five domains: (a) perceived environment, (b) personality, (c) behavior, (d) illness-related characteristics, and (e) demographics. Descriptive statistics and multiple regression were used to analyze the data and test the hypotheses.

A relationship existed among the independent variables of adherence, father's use of alcohol and tobacco use, frequency of clinic visits, and the dependent variable of alcohol use by adolescents with chronic kidney disease ($\underline{R}$ =. 549). Together these variables accounted for 30.2% of the variance in the QF score indicating alcohol use by adolescents. Variables in the demographic characteristics were related to tobacco use, but not related to alcohol use. Gender was the only variable that remained in the final multiple regression analysis using all independent variables from five domains to predict tobacco use ($\underline{R}$ = .279). Gender accounted for 7.8% of the variance in the tobacco use score. Variables in the personality system were not related to alcohol and tobacco use;

therefore, hypotheses related to this domain were not supported. In this chapter, the findings are discussed with consideration of prior research and the conceptual framework. Conclusions derived from the findings are presented, limitations of the study are further discussed, and recommendations for future research are described.

The Frequencies of Alcohol and Tobacco Use by Adolescents

A nationwide study in Japan found that tobacco use among senior high school students increased with age, from about 20% in the first year to 37% to 45% in the third year (Kawabata et al., 1991a; Osaki & Minowa, 1996). Tobacco use was defined as smoking more than one cigarette in the past month. In this study, the rate of tobacco use among adolescents with chronic kidney disease was low compared with use among healthy adolescents; only 15% of these chronically ill adolescents used tobacco.

Similar results were also found for alcohol use. Only 31.2% ($n = 25$) of participants in this study were defined as "drinkers" or "problem drinkers" according to the QF Scale. However, Suzuki's (1994) national study showed that, of 14,438 senior high school students without health problems, 43.2% were drinkers and 17.4% were problem drinkers. The drinkers and problem drinkers among adolescents with chronic kidney disease were less frequent than reports of drinkers and problem drinkers among healthy adolescents (Suzuki, 1993, 1995, 1997; Suzuki et al., 1991). M. Nakamura (1996a) suggested that adolescents underreported substance use, such as experiences of cigarette use, when adolescents' privacy or anonymity was threatened in the data collection circumstances. In addition, the use of unreliable instruments often reduces the prevalence of substance use among adolescents (Kawabata et al., 1991b; M. Nakamura et

al., 1996a; Suzuki et al., 1994). In the current study, the instruments which measured alcohol and tobacco use showed optimal test-retest reliability. At the time of administering the questionnaire, adolescents were assured of their anonymity. Thus, the low prevalence rate of alcohol and tobacco use of adolescents with chronic kidney disease compared with healthy peers might not have resulted from the data collection method or instruments used in this study. Therefore, the lower rates may reflect the presence of chronic illness.

In prior studies about substance use among chronically ill adolescents, the prevalence of substance use varied. A low prevalence of substance use among chronically ill adolescents compared with healthy peers has been reported (Brook & Shiloh, 1993; Bussing & Aro, 1996; Forero et al., 1996; Frey et al., 1997; Gold & Gladstein, 1993; Hollen & Hobbie, 1996; Mulhern, et al., 1995; Shaw et al., 1993; Steele et al., 1996). Chronic illnesses of asthma, cancer, and diabetes were included in these samples, and subjects were recruited from clinics. Chronically ill adolescents' risk behavior may tend to be higher when the data collection is done outside of clinics, in settings such as diabetes sleep over camps, because of inclusion of healthier adolescents with diabetes in the sample (Gold & Gladstein, 1993). Clinic settings may include adolescents with more health problems or complications. Therefore, the rate of risk behavior may be lower among those groups because severe illness might reduce participation in risk behaviors.

Other studies that reported a higher prevalence of substance use among chronically ill adolescents used a questionnaire to identify chronically ill adolescents from healthy populations in settings such as schools (Bussing & Aro, 1996; Forero et al., 1996; Steele et al., 1996). In the current study, all subjects were recruited from specialty clinics,

and the low prevalence is consistent with prior studies in which clinic-based data were collected (Brook & Shiloh, 1993; Frey et al., 1997; Hollen & Hobbie, 1996; Mulhern, et al., 1995; Shaw et al., 1993).

In the multiple regression analysis, the frequency of clinic visits was significantly and positively associated with alcohol use by adolescents with chronic kidney disease (Table 21). Adolescents who visited the clinic in a shorter time interval were less likely to use alcohol. Although tobacco use was not explained by the frequency of clinic visits, this may be due to the limited number of tobacco users in the study. Frequency of clinic visits might be related to illness severity or restriction from illness as adolescents with more severe illness and regimens are required to visit the clinic more frequently.

The other explanation for frequency of clinic visit as a predictor of alcohol use is related to the opportunity to talk with the health care professionals. Adolescents may have information about their health and illness conditions, and they have opportunities to ask questions about their concerns. The interactions between adolescents and health care professionals may enhance adolescents' awareness of the harm of alcohol and tobacco. Nurses may need to use such opportunities for adolescents to develop healthy lifestyle choices.

Alcohol and Tobacco Use and Illness-Related Characteristics

In this study, alcohol use was explained by adherence. A Spearman correlation indicated a relationship between alcohol use and adherence to the diet and medication regimen, and the overall score on adherence. Lower levels of adherence were associated with higher levels of alcohol use. The mean adherence score of medication was higher

than the mean score of other regimens, and most adolescents with chronic kidney disease followed the treatment prescription. Adherence to dietary regimens was the lowest of all regimens. Because the average Japanese salt intake is 13 g per day compared with the diet regimen for adolescents with chronic kidney disease that requires 6 to 7 g per day, adherence to the diet regimens appears difficult for adolescents with chronic kidney disease. Adhering to the prescribed diet will be especially difficult for adolescents when they dine out with their friends.

Suzuki (1997) stated that healthy adolescents use alcohol mostly with their peers at bar-type restaurants where various salty foods are served with alcohol beverages. It was reported that most adolescents drank alcohol with peers and only a small percentage of healthy adolescents drank alcohol by themselves (Suzuki). Alcohol use among adolescents occurred in conjunction with social events of their daily life. Therefore, difficulty adhering to restrictions of daily life, such as dietary restriction, accompanies alcohol use in this finding. Consequently, in addition to understanding the harmful effect on alcohol to adolescents with chronic kidney disease, these adolescents should also have knowledge about salt content in foods served at bar-type restaurants. Adolescents with chronic kidney disease should be taught how to select low salt diet foods from restaurant or fast food menus.

Although the statistical value was limited, the multiple regression showed that tobacco use was explained by the overall adherence score and club activity noninvolvement. Nonadherence was related to both alcohol and tobacco use by adolescents with chronic kidney disease. In this study, most adolescents (n = 54, 67.5%) did not participate in club activities. Club activity noninvolvement seems to be contrary to the

view of Steele et al. (1996). They stated that daily life restriction might prevent engaging in risk behaviors because adolescents were less likely to be exposed to their deviant peers. However, findings suggested adolescents are more likely to use tobacco when they are less involved in club activity. Because higher stress and a more restrictive daily life were found in adolescents with chronic kidney disease than adolescents with other types of chronic disease (N. Nakamura et al., 1996; Takeda et al., 1997), such a situation may lead to tobacco use as method of coping with the stress of limited social opportunities or isolation from peers related to the illness. Although the number of tobacco users was small, these findings suggested that adolescents with chronic kidney disease are at risk for experiencing a threat to their health from smoking and may miss opportunities to socialize within a healthy peer culture by participating in club activities.

Demographic Characteristics Among Alcohol Users and Tobacco Users

There were several differences between alcohol users and tobacco users in terms of gender that may provide an understanding of risk behavior among adolescents with chronic kidney disease. Age and number of older siblings were not associated with either alcohol or tobacco use.

Age and Number of Older Siblings

Although age and number of older siblings were significant predictive variables for alcohol and tobacco use in many studies (Ichimura et al., 1992; Kawabata et al., 1991a, Kawabata, et al., 1998; Matsushita et al., 1996; Nozu, 1984; Osaki & Minowa, 1996; Wada & Fukui, 1994), there was no relationship of age or number of older siblings

to alcohol and tobacco use by adolescents with chronic kidney disease. Failure to find expected relationships might be related to the homogeneous nature of the study sample in which adolescent age was restricted to a narrow range and the limited number of subjects.

Gender and Tobacco Use

Twelve of the 80 adolescents with chronic kidney disease reported smoking more than one cigarette in the past month. There was a relationship between gender and tobacco use with males being more likely to engage in smoking. Male dominance of tobacco use has been previously reported both in healthy and chronically ill adolescents in Japan as well as other countries (Bussing & Aro, 1996; Forero et al., 1996; Gortmaker et al., 1990; Ichimura et al., 1992; Kawabata et al., 1991a; Kawabata et al., 1998; Matsushita et al., 1996; Nozu, 1984; Osaki & Minowa, 1996; Shaw et al., 1993; Wada & Fukui, 1994). Tobacco users in the current study were more likely to be alcohol users; moreover, among those subjects, tobacco use was habitual rather than experimental. Therefore, tobacco use by male adolescents should be carefully assessed as it may indicate increased probability of other health risk behavior such as nonadherence, alcohol use, and psychosocial problems related to activity restrictions. Kandel and Logan (1984) reported that early initiation of substance use usually becomes heavy use in later years. The health of chronically ill adolescents who become heavy tobacco users may deteriorate faster than the health of nonusers because studies suggested that the combination of habitual use of alcohol and tobacco induces proteuria which may lead to damaged kidney functions (Ito et al., 1999). More information will be necessary to prevent adolescents from becoming regular smokers. Further investigation should be focused on

health risk behavior as well as psychological problems among adolescents who have a higher number of prescribed regimen restrictions, especially these related to school activities.

Alcohol users among females. Contrary to tobacco use, male dominance was not found in alcohol use in this study. This finding is consistent with prior studies of Japanese healthy adolescents (Kawabata et al., 1991a; Matsushita et al., 1996; Osaki & Minowa, 1996; Suzuki, 1991; Suzuki et al., 1994; Wada & Fukui, 1994). Like healthy peers, female adolescents with chronic kidney disease in this study used alcohol as much as male peers. Alcohol use by females is a greater risk to their health than it is for males. It is reported that females of all ages are more susceptible to alcohol use than males; moreover, they tend to become abusers faster than males (Omoto; Takano & Nakamura). Because of trends of increasingly heavy alcohol use by females in their 20s (Omoto, 1997; Suzuki, 1995, 1997; Takano & Nakamura, 1996), female adolescents with chronic kidney disease have the possibility of damaging their kidney functions through the evolution of a long-term habit of alcohol use. Therefore, female as well as male adolescents with chronic kidney disease must be educated about the harm of their alcohol use by health care professionals.

Parental Influences on Alcohol and Tobacco Use

Two variables in the perceived environment system were related to alcohol and tobacco use among Japanese chronically ill adolescents. The influences of parental use of

alcohol and tobacco and parental norms are described and the importance to include parents for preventive education is discussed in this section.

Parental Use of Alcohol and Tobacco

Kawabata et al. (1991a) reported that males who had smoking parents had the highest rate of tobacco use. In his study, female adolescents' use of tobacco was related to their mother's use of tobacco, but not related to their father's use. In this study, father's use of alcohol and tobacco also explained alcohol use by adolescents with chronic kidney disease. The father's use of tobacco had a relationship to chronically ill adolescents' use of tobacco; however, no relationship was found between tobacco use and mother's use of tobacco. The findings of this study suggest that unhealthy lifestyle choices by parents, especially fathers' use of alcohol and tobacco, had an influence on adolescents' use of alcohol.

The findings in this study suggested that chronically ill adolescents also learned alcohol use from awareness of the alcohol use by parents. Japanese families allow adolescents to drink alcohol at dinner; that behavior is socially acceptable to a certain degree. Parents in this study might have the same behavior as parents of healthy Japanese adolescents. It will be necessary for parents, especially for fathers, to know the harm of alcohol use in chronic kidney disease and the importance of avoiding early initiation of alcohol use by adolescents.

Parental Norms

Spearman correlation coefficients showed that alcohol use was explained by parental norms about alcohol and tobacco use by their adolescent children. The multiple

regression showed that tobacco use by adolescents with chronic kidney disease was explained by parental norms about both alcohol and tobacco use by their adolescent. Adolescents used more tobacco when parents had a less strict norm toward alcohol and tobacco use for their adolescent children. Prior studies, which investigated the relationship between adolescents' alcohol use and the single variables of parental use of tobacco, parental use of alcohol, and parental norm of alcohol and tobacco use by their adolescent children, were consistent with the findings of this study (Kawabata et al., 1991a; Kojima et al., 1997; Ohtsu, 1989). Parental expressiveness of their more restrictive norms about alcohol and tobacco use by their adolescents' children may be a protective factor for engaging alcohol and tobacco use by adolescent children. Nurses need to educate parents about the harm of early initiation of alcohol use; moreover, nurses may need to encourage parents to express their strict norms to their children.

However, the relationship between parental norm and tobacco use in this study is very difficult to interpret because the test-retest reliability of the items assessing parental norms was as low as .60. Only a few studies (Kojima et al., 1997; Ohtsu, 1989) reported that and parental norms which promote permissiveness related to alcohol use by adolescents, and those studies did not report reliability of their instruments. The lower test-retest reliability in the current study might indicate that adolescents' perceptions of parental norms might change over time; moreover, parental norms might vary situation by situation. Whether adolescent perceptions accurately reflect the norms that parents intended to communicate was not determined by this study. Therefore, adolescent perceptions of parental norms may not actually represent the norms that parents hold.

Adolescents might not have stable or accurate perceptions of parental norms about alcohol and tobacco use.

Relationships of Results to the Conceptual Framework

In addition to research questions, the findings suggested insights into risk behavior among adolescents with chronic kidney disease related to the conceptual framework. The findings related to the conceptual framework are discussed in this section.

Covariation of Risk Behavior

In the current study, adolescents' use of tobacco and alcohol were correlated with one another ($R = .6505$, $P < .001$). Among adolescents with chronic kidney disease, such alcohol use was also associated with lower level of adherence to both diet and activity regimens. Jessor's (1991) problem behavior theory, which emphasizes the covariation of risk behaviors, can be applied to explain chronically ill adolescents' risk behavior, including nonadherence. Nonadherence may be regarded as an illness-related risk behavior and may reflect poorer self-care. This indicates that chronically ill adolescents who are weak in self-care will be more likely to engage in risk behavior such as alcohol and tobacco use than those who have good self-care practices.

Adolescents may be reluctant to disclose their unhealthy lifestyle habits such as alcohol and tobacco use to their physicians. Alcohol and tobacco use are also difficult to identify by disease condition because the disease condition is not directly affected by alcohol and tobacco use unless use is extremely heavy or long-term. Heavy users and

long-term users are more likely to be at risk for worsening their condition because they do not experience rapid changes in their conditions after using alcohol, tobacco, or both. Therefore, nonadherence may indicate problems with alcohol and tobacco use and help identify at-risk adolescents in clinical settings. In addition, adherence and alcohol and tobacco use were correlated in this study; promoting adherence may enhance healthy lifestyle choices. It is suggested that nurses should not regard alcohol and tobacco use as isolated problems distinct from adherence.

Meanings of Risk Behavior

Jessor (1991) stated that alcohol and tobacco use should be perceived as being purposeful, meaningful, and goal oriented. One of the purposes of risk behavior such as alcohol and tobacco use among adolescents is to gain autonomy from parents. However, these findings suggested a particular type of autonomy, self-reliance, was not related to risk behavior of alcohol and tobacco use by adolescents with chronic kidney disease. Although the statistical value was limited, club activity noninvolvement was related to tobacco use. The assumption of this study was that chronically ill adolescents were more likely to be isolated from healthy peers because of restrictions in daily life. Isolation from peers might encourage adolescents to engage in risky behavior to gain peer acceptance. Adolescents with chronic kidney disease might use tobacco to cope with frustration (Jessor, 1991, 1993), negative self-image (Brook & Shiloh, 1993), or sense of loneliness (Forero et al., 1996) because of activity restriction. However, the current study did not include other variables which measure psychosocial functioning other than autonomy.

Further study will be needed to explore the meaning of risk behavior among chronically ill adolescents.

Risk and Protective Factors in Perceived Environment System and Illness-Related Characteristics

In this study, several risk or protective factors for chronically ill adolescents' risk behavior were suggested. Parental use of alcohol and tobacco was a risk factor for alcohol use by chronically ill adolescents. Parental norms of alcohol and tobacco use by their adolescent children were a protective factor for tobacco use. Nonadherence in the behavior domain was a risk factor of adolescents' engagement in alcohol use.

Though the frequency of clinic visits was related to alcohol use, this might reflect illness severity or opportunities to discuss their health concerns with health care professionals. Awareness of illness severity may be important protective factors to avoid risk behavior. Adolescents with chronic kidney disease usually do not have any apparent physical symptoms unless their disease conditions worsens; therefore, understanding illness severity is often difficult. Having perceptions of their illness conditions that are inconsistent with their actual health status, such as disease denial, is related to risk behavior (Gold & Gladstein, 1993). Adolescents will be able to avoid risk behavior if they are aware of their illness severity and place value on their health.

The Conceptual Domain Unrelated to Risk Behavior by Adolescents with Chronic Kidney Disease: Personality System

There was no relationship between autonomy and risk behavior of alcohol and tobacco use. This might be because of the self-reliance scale, which measured autonomy, used for this study. Onodera (1993) developed this by using Japanese college students whose average ages were 21.1 years in males and 19.9 years in females compared with a mean age of 16.7 years in the current study. Such age differences might be related to the low internal consistency of this instrument in this study.

Autonomy has been identified as an important psychological variable related to engagement in risk behavior (Jessor, 1991, 1993). The conceptualization of autonomy in this study was self-reliance, which is only one component of autonomy (Steinberg & Silverberg, 1986). Risk behavior has been reported to have a significant relationship with an orientation toward autonomy or value on autonomy (Jessor, 1987, 1991) and behavioral autonomy (Irwin, 1993; Irwin & Millstein, 1992, Steele et al.,1996); however, few studies have examined the relationship between risk behavior and self-reliance itself.

In the current study, emotional ties to parents, the conceptualization of attachment, was measured by Onodera's attachment scale. However, risk behavior of alcohol and tobacco use was not explained by this type of attachment in the personality domain. Conceptualization and differentiation among detachment, separation from parents, emotional autonomy, and insecure attachment were not consistent among theorists. Schneider and Younger (1996) suggested that theoretical writing and empirical reports are highly inconsistent as to whether development of autonomy is associated with feelings of closeness or distance from parents. Such conceptual distinctions among autonomy and attachment may make their relationship to risk behavior clearer. Because establishing autonomy is the central task of development for adolescents aged 15 to 18

years, studies will be needed to use different conceptualizations and measures of autonomy and attachment to explore the relationship of these variables with risk behavior.

Limitations of the Study Findings

There are major limitations of the current study because of instrumentation. Criterion and predictive validity were not reported for the items to measure parental norms about alcohol and tobacco use by their adolescent children. The low test-retest reliability of these items limited interpretation of the findings. Generalization of the findings was also limited because of the small number of tobacco users among the subjects. The homogeneous nature of the study sample did not permit determination of significant age differences in alcohol and tobacco use. All data were reported by adolescents; therefore, social desirability was not completely eliminated because of the nature of questions related to alcohol and tobacco use. In this study, variables in the conceptual framework were selected based on the literature review. The variables and sample selected for this study permitted only partial explanations of alcohol and tobacco use by Japanese adolescents with chronic kidney disease.

Conclusions

Based on the findings, the following conclusions are drawn:

1. About one third of Japanese adolescents with chronic kidney disease used alcohol, and 15 % of Japanese adolescents with chronic kidney disease used tobacco.

Compared with prior studies, Japanese adolescents with chronic kidney disease were less likely to engage in alcohol and tobacco use than healthy peers.

2. The low prevalence rates might reflect illness severity or restriction from illness that might reduce opportunities to engage in alcohol and tobacco use. Illness-related characteristics reflecting illness severity may predict alcohol and tobacco use among Japanese adolescents with chronic kidney disease.

3. Father's use of alcohol and tobacco is one key predictor of alcohol use among Japanese adolescents with chronic kidney disease.

4. Gender is one key predictor of tobacco use, but not alcohol use, among Japanese adolescents with chronic kidney disease.

5. Parental strict norms about alcohol and tobacco use by their adolescents' children may be effective in preventing tobacco use by Japanese adolescents with chronic kidney disease.

6. Covariation among risk behaviors is found in Japanese adolescents with chronic kidney disease. The illness-related risk behavior, lower adherence, is one key predictor of alcohol and tobacco use among Japanese adolescents with chronic kidney disease.

7. Japanese adolescents with chronic kidney disease who are female use alcohol as much as males. Females as well as males need to be aware of the harm of alcohol use.

8. Japanese adolescents with chronic kidney disease who were tobacco users smoked regularly and used alcohol as well. In addition, they were likely to be male and not likely to involved in club activity. Therefore, tobacco users may be at risk to develop health problems as well as miss opportunities to be exposed to a healthy peer culture.

9. Measures of autonomy and attachment to parents were not associated with alcohol and tobacco use by adolescents with chronic kidney disease in this study. Operationalizations of different conceptual aspects of autonomy and attachment may explain alcohol and tobacco use by these adolescents.

10. Because of the limited amount of explained variance found in this study, there may be variables other than those used in this study that may predict alcohol and tobacco use among adolescents with chronic kidney disease.

Recommendations

The following recommendations for research are offered:

1. Replicate the study with subjects who have different kinds of chronic diseases.

2. Explore the other determinants of alcohol and tobacco use among chronically ill adolescents, and replicate the study with chronically ill adolescents who are likely to engage in alcohol and tobacco use, such as adolescents who may visit the clinic less frequently, are prescribed regimens which restrict club activity involvement, have difficulties in adhering to the prescribed regimens, or a combination of these.

3. Investigate the causal relationships among parental norms, parental use of alcohol and tobacco, and chronically ill adolescents' risk behavior by using a longitudinal design.

4. Explore how parents perceive the parental norm about alcohol and tobacco use by their adolescents children.

5. Replicate the study to investigate the relationship among autonomy, attachment and risk behavior by using different instruments to measure autonomy and attachment.

REFERENCES

Amemiya, H. (1996). Current status of organ transplantation in Japan. Transplantation Proceedings, 28, 1193-1195.

Barakat, L. P., Kazak, A. E., Meadows, A. T., Casey, R., Meeske, K., & Stuber, M. L. (1997). Families surviving childhood cancer: A comparison of posttraumatic stress symptoms with families of healthy children. Journal of Pediatric Psychology, 22, 843-59.

Baumrind, D. (1991). Adolescent exploratory behavior: Precursors and consequences. In L. Lipspitt & L. L. Mitnick (Eds.), Self-regulatory behavior and risk taking: Causes and consequences (pp. 109-141). Norwood, NJ: Ablex.

Baer, P. E., & Bray, J. H. (1999). Adolescent individuation and alcohol use. Journal of Studies on Alcohol, Supl. 13, 52-62.

Block, J., & Block, J. H. (1980). The California child Q-set. Palo Alto, CA: Consulting Psychologists Press: In A. Onodera (1993). Comparative study of adolescent views on their parents and their self-reliance in Japan and the United States. The Japanese Journal of Psychology, 64, 147-152.

Brook, U., & Shiloh, S. (1993). Attitudes of asthmatic and non asthmatic adolescents toward cigarettes and smoking. Clinical Pediatrics, 32, 642-646.

Bussing, R., & Aro, H. (1996). Youth with chronic conditions and their transition to adulthood:Findings from a finish cohort study. Archives Pediatric and Adolescent Medicine, 150, 181-187.

Chassin, L., Presson, C. C., Sherman, S. J., & McConnell, A. R. (1995). Adolescent health issues. In M. C. Robert (Ed.), Handbook of pediatric psychology (2nd. ed., pp. 723-740). New York: Guilford.

Chen, Y. (1997). Individual and social factors associated with male and female adolescent sexual risk behaviors: The United States and Taiwan. Dissertation Abstracts Internationl, 57, 4129. (ProQuest Dissertation Abstracts No. 9704421)

Children and Family Bureau, Japanese Ministry of Health and Welfare (1996). Syouni mansei tokutei shikkan taisaku cyousa kekka no youshi [The summary of studies on specific child chronic disease]. In M. Maeda (1996), Syouni mansei tokutei shikkann no doukou to shisaku [Trends and policies for specific child chronic disease]. Chiiki Hoken, 27(9), 5-13.

Cohen, D. A., Richardson, J., & LaBree, L. (1994). Parenting behaviors and the onset of smoking and alcohol use: A longitudinal study. Pediatrics, 94, 368-375.

Cooper, M. L., Shaver, P. R., & Collins, N. L. (1998). Attachment styles, emotion regulation, and adjustment in adolescence. Journal of Personality and Social Psychology, 5, 1380-1397.

DiClemente, R. J., Hanse, W. B., & Ponton, L. E. (Eds.). (1996). Handbook of Adolescent Health Risk Behavior. New York: Plenum Press.

Donovan, J. E., Jessor, R., & Costa, F. M. (1991). Adolescent health behavior and conventionality-unconventionality: An extension of problem behavior theory. Health Psychology, 10, 52-61.

Forero, R., Bauman, A., Young, L., Booth, M., & Nutbeam, D. (1996). Asthma, health behaviors, social adjustment, and psychosomatic symptoms in adolescence. Journal of Asthma, 33, 157-164.

Frey, M. A., Guthrie, B., Loveland-Cherry, C., Park, P. S., & Foster, C. M. (1997). Risky behavior and risk in adolescents with IDDM. Journal of Adolescent Health, 20, 38-45.

Fuligni, A. J., & Eccles, J. S. (1993). Perceived parent-child relationships and early adolescents' orientation towards peers. Developmental Psychology, 29, 622-632.

Gold, M. A., & Gladstein, J. (1993). Substance use among adolescents with diabetes mellitus: Preliminary findings. Journal of Adolescent Health, 14, 80-84.

Gortmaker, S. L., Walker, D. K., Weitzman, M., & Sobol, A. M. (1990). Chronic conditions, socioeconomic risks, and behavioral problems in children and adolescents. Pediatrics, 85, 267-276.

Greenberg, M. T., Siegel, J. M., & Leitch, C. (1983). The nature and importance of attachment relations to parents and peers during adolescence. Journal of Youth and Adolescence, 12, 373-386.

Guthrie, B. J., Loveland-Cherry, C., Frey, M. A., & Dielman, T. E. (1994). A theoretical approach to studying health behaviors in adolescents: An at-risk population. Family and Community Health, 17, 35-48.

Hanna, K. (1993). Health behaviors of adolescents who have been diagnosed with cancer. Issues in Comprehensive Pediatric Nursing, 16, 219-228.

Haupt, R., Byrne, J., Connelly, R. R., Mostow, E. N., Austin, D. F., Holmes, G. R., Holmes, F. F., Latourette, H. B., Teta, M. J., & Strong, L. C. (1992). Smoking habits in survivors of childhood and adolescent cancer. Medical & Pediatric Oncology, 20, 301-306.

Health and Welfare Statistics Association (1998). Kokumin Seikatsu Kiso Cyousa [Basic statistics of Japanese] (pp.104-107). Tokyo: Koussei Toukei Kyoukai.

Hintze, J. L. (1991) PASS. Kaysville, Utah: Hintz.

Hollen, P. J., & Hobbie, W. L. (1993). Risk taking and decision making of adolescent long-term survivors of cancer. Oncology Nursing Forum, 20, 769-776.

Hollen, P. J., & Hobbie, W. L. (1996). Decision making and risk behaviors of cancer-surviving adolescents and their peers. Journal of Pediatric Oncology Nursing, 13, 121-134.

Holmbeck, G. N. (1994). Adolescence. In V. S. Ramachandran (Ed.), Encyclopedia of human behavior (Vol. 1, pp. 17-28). San Diego, CA: Academic Press.

Ichimura, K. Watanabe, M., Okada, K., Nishioka, N., Mochizuki, Y., Minagawa, K., Kawabata. T., Nakamura, M., Nozu, Y., Takahashi, H., Iwai, K., Okajima, Y., & Takaishi, M. (1992). Smoking behavior among adolescents in Japan: Results from the study of Japan Adolescent Smoking Survey (JASS). Japanese Journal of School Health, 34, 319-328.

Ichimura, K., Minagawa, K., Watanabae, M., Nozu, Y., & Okada, K. (1995). Trends of antismoking countermeasure for adolescents: A report of 9th World Conference on Tobacco and Health. Japanese Journal of School Health, 37, 443-449.

Igarashi, T. (1996). Kensyuui no tameno syouni jinshikkan no rinsyou [Clinicals of pediatric nephrology for residents]. Tokyo: Shindan to Chiryou sya.

Igra, V., & Irwin, C. E. Jr. (1995). Theories of adolescent risk-taking behavior. In R. J. Diclemente, W. B. Hansen, & L. E. Ponton (Eds.), Handbook of adolescent health risk behavior (pp. 35-51). New York: Plenum Press.

Iitaka, K., Igarashi, S., & Sakai, T. (1994). Hypocomplementaemia and membrano-proliferative glomerulonephritis in school urinary screening in Japan. Pediatric Nephrology, 8, 420-422.

Ikegami, N., Saito, M., Yamada, K., Arakubo, A., & Kouno, H. (1983). Seisyounen no insyu, kitsuenkoudou to sono shinriteki haikei [Drinking and smoking behavior among adolescents and its psychological background]. Alkouru Kenkyuu to Yakubutsu Izon (suppl.), 21, 260-261.

Irwin, C. E. (1993). Adolescence and risk taking: How are they related? In N. J. Bell & R. W. Bell (Eds.), Adolescent risk taking. London: Sage.

Irwin, C. E., & Millstein, S. G. (1992). Risk-taking behaviors and biopsychosocial development during adolescence, In E. J. Susman, L. V. Fagans, & W. R. Ray (Eds.), Emotion, cognition, health and development in children and adolescents: A one way street. Mahwah, NJ: Lawrence Erlbaum.

Isaji, M. (1996). Syouni mansei tokutei shikkan taisaku no torikumi kara: neezu cyousa kara sisutemu ka e [Policies of Specific child chronic disease: From needs surveillance to systematic approach]. Chiiki Hoken, 27, 42-51.

Ito, S., Ueno, M., Izumi, T., & Arakawa, M. (1999). Induction of transient proteinuria, hematuria, and glucosuria by ethanol consumption in Japanese alcoholics. Nephron, 82, 246-253.

Ito, H., Yoshikawa, N., & Honda, M. (1999). Japan. In T. M. Barratt, E. D. Avner, & W. E. Harmon (Eds.), Pediatric nephrology (4th ed., pp.1354-1357). Philadelphia: Lippincott Williams & Wilkins.

Japanese Ministry of Education, Sports, & Culture. (1995). Gakkou Kihon Cyousa [Monbusyo school survey]. Tokyo: Japanese Ministry of Education, Sports, & Culture.

Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. British Journal of Addiction, 82, 331-42.

Jessor, R. (1991). Risk behavior in adolescence: A psychosocial framework for understanding and action. Journal of Adolescent Health, 12, 597-605.

Jessor, R. (1993). Successful adolescent development among youth in high-risk settings. American Psychologist, 49, 117-126.

Jessor, R., Donovan, J. E., & Costa, F. M. (1991). Beyond adolescence: Problem behavior and young adult development. Cambridge, England: Cambridge University Press.

Jessor, R., Van Den Bos, J., Vanderryn, J., Costa, F. M., & Turbin, M. S. (1995). Protective factors in adolescent problem behavior: Moderator effects and developmental change. Developmental Psychology, 31, 923-933.

Kandel, D. B., & Logan, J. A. (1984). Patterns of drug use from adolescents to young adulthood: I. Periods of risk for initiation, continued use, and discontinuation. American Journal of Public Health, 74, 660-666.

Kanematsu, Y. (1996). Manseishikkankanji no syakai tekiouryoku no sokushin ni kansuru kenkyu [Studies on social adaptability of chronically-ill children]. Reports on Researches by Grantees, the Ministry of Education, Sports, & Culture, 1992-1994. Chiba, Japan: Chiba University School of Nursing.

Kaplan, H. B., Johnson, R. J., & Bailey, C. A. (1987). Deviant peers and deviant behaviors: Further elaboration of a model. Social Psychology Quarterly, 50, 277-284.

Kato, T. & Takagi, H. (1980). Seinenki ni okeru dokuritsu ishiki no hattatsu to jikogainen tono kankei [The development of adolescents' autonomy and its relationship to self-perception] Kyouikushinnrigaku Kennkyu, 28, 336-340.

Kawabata, T. (1995) Seijinbyou yobou to gakkou kenkou kyouiku [Prevention of chronic health disease and school health education]. Chiryou, 77(12), 65-70.

Kawabata, T., Nakamura, M., Oshima, A., Hiyama, T., Minagawa, K., Nishioka, N., Mochizuki, Y., Okajima, Y., Ichimura, K., Takahashi, H., Watanabe, M., Nozu, Y., Iwai, K., Okada, K., & Takaishi, M. (1991a). Seisyounen no kitsuen insyu koudou: Japan Know Your Body Study yori [Smoking and alcohol drinking behavior among Japanese adolescents: Results from "Japan Know Your Body" Study]. Japanese Journal of Public Health, 38, 885-899.

Kawabata, T., Minagawa K., & Nishioka, N. (1991b). Seisyounen no kitsuen koudou no teigi no hyoujyunka: Nihon seisyounen kitsuen cyousa (JASS) no kekka yori [Standardization of definitions concerning smoking behavior among Japanese adolescents: Results from the Japan Adolescent Smoking Survey (JASS)]. Japanese Journal of Public Health, 38, 859-67.

Kawabata, T., Shimai, S., & Nishioka, N. (1998). The relationship between smoking behavior and self-esteem among elementary and junior high school students. Japanese Journal of Public Health, 45(1), 15-26.

Kawane, H. (1993). Smoking among children and young people in Japan. Thorax, 48, 96.

Kenny, M. E., & Rice, K. G. (1995). Attachment to parents and adjustment in late adolescent college students: Current status, applications, and future considerations. The Counseling Psychologist, 23, 433-456.

Kojima, A., Watanabe, Y., & Aoki, H. (1997). Koukousei no insyukoudou ni kansuru kenkyuu: Oyako kankei wo cyuushin ni [Studies on drinking behavior of high school students: Focus on the relation between parents and students]. Japanese Journal of School Health, 39, 221-232.

La Greca, A. M., & Schuman, W. B. (1995). Adherence to prescribed medical regimens. In M. C. Roberts (Ed.), Handbook of Pediatric Psychology (2nd ed., pp. 55-83). New York: The Guilford Press.

Lamborn, S. D., & Steinberg, L. (1993). Emotional autonomy redux: Revising Ryan and Lynch. Child Development, 64, 483-499.

LeSon, S., & Gershwin, M. E. (1995). Risk factors for asthmatic patients requiring intubation: A comprehensive review, Alloergologia et Immunopathologia, 23, 235-247.

Maeda, M. (1996). Syouni mansei tokutei shikkann no doukou to shisaku [Trends and policies for specific child chronic disease]. Chiiki Hoken, 27(9), 5-13.

Maru, M., Tanaka, C., Kurayama, H., & Fujisawa, Y. (1998). Tobacco and alcohol use among adolescents with chronic kidney disease. Journal of School of Nursing Chiba University, 20, 49-58.

Matsushita, S., Suzuki, K., Higuchi, S., Takeda, A., Takagi, S., & Hayashida, M. (1996). Alcohol and substance use among Japanese high school students. Alcoholism: Clinical and Experimental Research, 20, 379-383.

Mayer, J., & Filstead, W. J. (1979). The adolescent alcohol Involvement Scale: An instrument for measuring adolescents' use and misuse of alcohol. Journal of Studies on Alcohol, 40, 291-300.

Meeking D. R., & Cavan, D. A. (1997). Alcohol ingestion and glycemic control in patients with insulin-dependent diabetes mellitus. Diabetic Medicine, 14, 279-283.

Millstein, S. G., & Igra, V. (1995). Theoretical models of adolescent risk-taking behavior. In J. L. Wallander & L. Siegel (Eds.), Adolescent health problems: Behavioral perspectives (pp. 52-71). New York: Guilford.

Millstein, S. G., Petersen, A., & Nightingale, E. O. (Eds.). (1993). Promoting the health of adolescents: New directions for the twenty-first century. NY: Oxford University Press.

Mulhern, R. K., Tyc, V. L., Phissp, S., Crom, D., Barcley, D., Greenwald, C., Hudson, M., & Thomposon, E. I. (1995). Health-related behaviors of survivors of childhood cancer. Medical and Pediatric Oncology, 25, 159-165.

Nakamura, M. (1996a). Seisyounenn kitsuen jittai cyousa no shinraisei no kentou [Reliability testing of Japan Adolescents' Smoking Survey questionnaire by using the same data set of validity testing]. In A. Ohshima (Ed.), Bouen to sono jittai haaku ni kansuru cyousa kenkyu cyousa houkokusyo [Reports of studies on smoking prevention and survey] (pp. 97-99). Japan: Kenkou Tairyokuzukuri Jigyou Zaidan.

Nakamura, M. (1996b). Seisyounenn kitsuen jittai cyousa no datousei no kentou [Validity testing of Japan Adolescents' Smoking Survey questionnaire]. In A. Ohshima, (Ed.), A. Bouen to sono jittai haaku ni kansuru cyousa kenkyu cyousa houkokusyo [Reports of studies on smoking prevention and survey] (pp. 42-60). Japan: Kenkou Tairyokuzukuri Jigyou Zaidan.

Nakamura, M., Kanematsu, Y., Yokota, M., Takeda, J., Nakamura, N., Maru, M., Noguchi, N., Uchida, M., & Sugimoto, Y. (1997). Manseishikkan kanji to kenkouji no social support [Social support of chronically-ill children and healthy children]. Journal of Japan Academy of Nursing Science, 17, 40-47.

Nakashima, M., Minagawa, M., Nakamura, M., Kanematsu, Y., Machida, K., Fujisawa, Y., & Uchida, Y. (1994) Self-care, stress, and social support of children with chronic renal disease: Comparison of children in outpatient and inpatient units. Journal of School of Nursing Chiba University, 16, 61-68.

Nakamura, N., Kanematsu, Y., Takeda, J., Uchida, M., Furuya, K., Maru, M., & Sugimoto, Y. (1996). Manseishikkan kanji no stress [Stress experienced by children with chronic illness]. The Japanese Society of Child Health, 55, 55-60.

NHK Housou Bunka Kenkyuujyo Yoron Cyousa bu (Ed.). [National Broadcasting Association Center of Broadcasting Culture Public Opinion Research Division] (1995). Gendai chuugakusei koukousei no seikatsu to ishiki (2nd ed.) [NHK Public Opinion Research: Lifestyle and perceptions among junior and senior high school students in the modern society]. Tokyo: Meiji Tosyo.

Nozu, Y. (1984). A study on actual situation of youth smoking in Japan with reference to smoking rate and smoking conditions among senior high school students. Japanese Journal of School Health, 26, 571-579.

Ohtsu, K. (1989). Chugaku koukousei no insyukoudou ni kansuru kenkyu: Sono 1 jiga jyoutai to insyukeikou tono kanren [The first report of studies on drinking behavior of junior and senior high school students: The relationship between ego status and drinking tendency]. Japanese Journal of School Health, 29, 289-300.

Omoto, M. (1997). Jyakunensya ni okeru insyu koudou [Drinking behavior of young adults]. Nihon Rinsyou, 55, 527-533.

Onodera, A. (1993). Comparative study of adolescent views on their parents and their self-reliance in Japan and the United States. The Japanese Journal of Psychology, 64, 147-152.

Osaki, Y., & Minowa, M. (1996). Cigarette smoking among junior and senior high school students in Japan. Journal of Adolescent Health, 18, 59-65.

Paterson, J., Pryor, J., & Field, J. (1995). Adolescent attachment to parents and friend to aspects of self-esteem. Journal of Youth and Adolescence, 24, 365-374.

Perrin, J. M. (1991). Adolescents with chronic illness, American Journal of Diseases of Children, 145, 1361-2.

Research Group on Progressive Chronic Renal Disease (1999). Nationwide and long-term survey of primary glomerulonephritis in Japan as observed in 1,850 biopsied cases. Nephron, 82, 205-213.

Rossow, I., & Rise, J. (1994). Concordance of parental and adolescent health behaviors. Social Science and Medicine, 38, 1299-1305.

Ryan, R. M., & Lynch, J. H. (1989). Emotional autonomy versus detachment: Revisiting the vicissitudes of adolescents and young adulthood, Child Development, 60, 340-356.

Schneider, B. H., & Younger, A. J. (1996). Adolescent-parent attachment and adolescents' relations with their peers: A closer look. Youth and Society, 28(1), 95-108.

Shaw, N, J., McClure, R. J., Kerr, S., Lawton, K., & Smith, C. S. (1993). Smoking in diabetic teenagers. Diabetic Medicine, 10, 275-277.

Steele, C. A., Kalnins, I. V., Jutai, J. W., Stevens, S. E., Bortolussi, J. A., & Biggar, W. D. (1996). Lifestyle health behaviors of 11- to 16-year-old youth with physical disabilities. Health Education Research, 11, 173-186.

Stein, R. E. K. (1992). Chronic physical disorders. Pediatric Review, 13, 224-229.

Steinberg, L., & Silverberg, S. (1986). The vicissitudes of autonomy in early adolescence. Child Development, 57, 841-851.

Suzuki, K. (1993). Miseinen ni okeru insyu mondai: Koukousei ni okeru insyu mondai [Alcohol problem among underage drinkers: Drinking problems of high shool students]. In H. Kouno & F. Ohya (Eds.), Wagakuni no arukouru kanren mondai no genjyou: Arukoru hakusyo [Japanese National Report of Alcohol Related Problem] (pp. 55-80). Tokyo: Kouseisyo Hoken Iryou Kyoku Seishin Hoken Ka [Ministry of Health and Welfare Division of Public Health and Medicine, Mental Health Unit].

Suzuki, K. (1995). Kodonomo insyu ga abunai [Dangerous use of alcohol by children and adolescents]. Tokyo: Touhou Syobou.

Suzuki, K. (1997). Miseinensya no insyujittai [Japanese adolescents' drinking and problem drinking]. Nihon Rinsyou, 55, 522-526.

Suzuki, K., Matsushita, S., Higuchi, S., & Takeda, A. (1994). Miseinensya no mondai insyu sukeiru [Quantity-Frequency Scale (QF Scale) for adolescent problem drinking]. Japanese Journal of Alcohol & Drug Dependence, 29, 168-178.

Suzuki, K., Matsushita, S., Muramatsu, T., Muraoka, H., Yamada, K., Shigemori, K., Takagi, S., & Kono, H. (1991). Saikin no koukousei ni okeru mondai insyusya ni tuiteno kenkyu [Problem drinkers among high school students in Japan]. Japanese Journal of Alcohol & Drug Dependence, 26, 142-152.

Takagi, H. (1997). Organ transplants still too few in Japan and Asian countries. Transplantation Proceedings, 29, 1580-1583.

Takano, T., & Nakamura, K. (1996). Josei no insyu: Jyoseino insyu syuukan no henka to arukouru kanren mondai [Alcohol drinking by females: Changes of drinking habits by female and alcohol related problems]. In H. Kouno & F. Ohya (Eds.), Wagakuni no arukouru kanren mondai no genjyou: Arukouru hakusyo [Japanese National Report of Alcohol Related Problem] (pp. 55-80). Tokyo: Kouseisyo Hoken Iryou Kyoku Seishin Hoken Ka [Ministry of Health and Welfare Division of Public Health and Medicine, Mental Health Unit].

Takei, N. (1993). Is tobacco smoking still fashionable in Japan? Lancet, 342, 1491

Takeda, J., Kanematsu, Y. ,Furuya, K., Maru, M., & Nakamura, N. (1997). Daily life of chronically ill children in outpatient clinics: Activities and feelings about school life and self-care practices: Chiba Kango Gakkai Kaishi, 3, 64-72.

Teraoka, S., Toma, H., Nihei, H., Ota, K., Babazono, T., Ishikawa, I., Shinoda, A., Maeda, K., Koshikawa, S., Takahashi, T., & Sonoda, T. (1995). Current status of renal replacement therapy in Japan. American Journal of Kidney Diseases, 25, 151-164.

Turner, R. A., Irwin, C. E., & Millstein, S. G. (1991). Family structure, family processes, and experimenting with substances during adolescence. Journal of Research on Adolescence, 1, 93-106.

Uchida, M., Nakamura, M., Takeda, J., Furuya, K., Nakashima, M., Kanematsu, Y., & Kouno, Y. (1994). Daily life, stress and social support of children with asthma. Journal of Chiba University School of Nursing, 16, 119-122.

Vanelli, M., Chiari, G., Adinolfi, B., Street, M. E., Capuano, C., Nizzia, P., & Terzi, C. (1997). Management of insulin dependent diabetes mellitus in adolescents. Hormone Research, 24 (suppl)4, 71-75.

Wada, K., & Fukui, S. (1994). Prevalence of tobacco smoking among junior high school students in Japan and background life style of smokers. Addiction, 89, 331-343.

Watanabe, M. (1996). Seisyounen kitsuen jittai cyousa no shinraisei no kentou [Validity testing of Japan Adolescents' Smoking Survey questionnaire]. In A. Ohshima (Ed.), Bouen to sono jittai haaku ni kansuru cyousa kenkyu cyousa houkokusyo [Reports of studies on smoking prevention and survey] (pp. 91-96). Japan: Kennkou Tairyokuzukuri Jigyouzaidan.

Yamazaki, M., & Amano, Y. (1993). Syouni mansei jin shikkan kannji ni okeru shinriteki mondai no kentou [Studies on psychological problems among children with pediatric kidney disease]. In Kouseisyou shinshin syougai kenkyu heisei 5 nendo houkokusyo [1993 annual report of the Ministry of Health and Welfare, Research Fund of the Mentally and Physically Handicapped] Syounino shishinsyougai yobou chiryo shisutemu ni kansuru kenkyu [Studies on prevention of children's psychological problems and studies on treatment system] (pp. 156-160). Japan: Ministry of Health and Welfare.

APPENDIX A

IRB APPROVAL FORM

UAB THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
UAB THE UNIVERSITY OF ALABAMA AT BIRMINGHAM for Human Use

Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

The Institutional Review Board for Human Use (IRB) has an approved Multiple Project Assurance with the Department of Health and Human Services and is in compliance with 21 CFR Parts 50 and 56 and ICH GCP Guidelines. The Assurance became effective on February 1, 1994 and the approval period is for five years. The Assurance number is M-1149.

Principal Investigator: MARU, MITSUE
Protocol Number: F980929003
Protocol Title: *Alcohol and Tobacco Use Among Chronically Ill Adolescents in Japan*

The IRB reviewed and approved the above named project on 10/14/98. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project recieved FULL COMMITTEE review.

IRB Approval Date: 10/14/98

Date IRB Approval Issued: 11-4-98

Ferdinand Urthaler MD
Ferdinand Urthaler, M.D.
Chairman of the Institutional Review Board
for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

The University of Alabama at Birmingham
1170B Administration Building 701 South 20th Street
Birmingham, Alabama 35294-0111 (205) 934-3789 • FAX (205) 975-5977

APPENDIX B

SHORT FORM FOR RESEARCH STUDY

SHORT FORM FOR RESEARCH STUDY

The following information is provided to inform you about the research project and your participation in it. Please feel free to ask any questions you may have about the study and/or the information given.

Explanation of procedure

This is a study of adolescents with diagnosis of chronic kidney disease and their families. I am Mitsue Maru, a doctoral student at the University of Alabama at Birmingham School of Nursing. I am interested in adolescents with chronic illness who visit the specialty clinic and their families. I would like to understand better the daily life of adolescents with chronic kidney disease. You are being invited to participate because you are between 15 to 18 years of age and attend a senior high school. In order to be eligible for the study, you must live with your parents. You must be on medication and have chronic kidney disease.

The study requires you to complete a paper and pencil questionnaire about you and your family. All of these forms will be completed during the waiting time of your clinic visit. In addition, I will review your medical record to learn more about your medical treatment.

Risk and discomfort

There will be no risks to you for participating in this study except the inconvenience of time and the occasional but rare discomfort some people experience in reporting about their perceptions. You will not be required to answer questions if you are uncomfortable with them.

Benefits

The benefits of your participation are that it will help health care providers to better understand adolescents with chronic illness. Your participation can help other adolescents.

Confidentiality

Your rights to privacy will be maintained in the following manner: (1) you will complete the questionnaires individually in a private location in the specialty clinic, and your name will not appear on any of the questionnaires, (2) all data obtained during the course of this study will be kept confidential and will be accessible only to the investigator, (3) should the results of this project be published, group information will be reported and no information will be shared which identifies individual participants.

Withdrawal without prejudice

You are free to withdraw your consent and discontinue participation in the project at any time without prejudice. There will be no costs you for your participation.

Payment for research-related injuries

UAB has made no provision for monetary compensation in the event of physical injury resulting from the research. Chiba University School of Nursing will not pay for medical treatment required as a result of research-related injuries and will not provide other compensation in the event of physical injury resulting from the research.

Questions

If you have any questions about the research, Mituse Maru will be glad to answer them. Mitsue Maru's' number is (043) 226-2419. If you have questions regarding the rights of research subjects, you may contact Dr. Junko Takeda, the Department of Child Nursing at Chiba University School of Nursing, who will answer them. Dr. Takeda's telephone number is (043) 226-2416

APPENDIX C

THE QUESTIONNAIRE

QF SCALE

Please answer the following questions by circling the number.

1. How often do you drink alcohol such as beer, wine, or sake cocktail?

   1) never
   2) once or twice a year
   3) once a week
   4) several times or more a week

2. How much do you drink, when you do drink?

   1) never
   2) less than 1 drink (1 drink is equivalent to a glass of beer)
   3) 1 drink
   4) 2 drinks
   5) 3 to 6 drinks
   6) 6 or more drinks
   7) drink until get drunk

TOBACCO USE

1. Did you smoke in the last month?

   1) did not smoke
   2) smoked one cigarette
   3) smoked two to nineteen cigarettes
   4) smoked twenty or more cigarettes

PARENTAL USE OF ALCOHOL AND TOBACCO

1. Does your father smoke?

   1) no
   2) used to smoke
   3) yes
   4) do not know

2. Does your mother smoke?

   1) no
   2) used to smoke
   3) yes
   4) do not know

3. Does your father drink alcohol at home?

   1) no
   2) sometimes
   3) everyday

4. Does your mother drink alcohol at home?

   1) no
   2) sometimes
   3) everyday

PARENTAL NORMS OF ALCOHOL AND TOBACCO USE

1. What do your parents think about you drinking alcohol?

    1) You should not drink
    2) You can drink only for a special occasion
    3) You can drink if it is a little
    4) My parents are not interested in
    5) Other

2. What do your parents think about you smoking cigarettes?

    1) You should not smoke
    2) You can smoke only for a special occasion
    3) You can smoke if it is a little
    4) My parents are not interested in
    5) Other

SELF-RELIANCE SCALE

The following statements describe the confidence in yourself. For each item, indicate how much you agree or disagree with the statement, as it refers to yourself, by choosing the appropriate number.

1) strongly disagree
2) slightly disagree
3) neither agrees nor disagrees
4) slightly agree
5) strongly agree

1. I can solve my own problems I may face in my life.
2. I can decide my future goals or career by myself.
3. I am confident that I can be independent economically.
4. I can hold my opinion even others differ.
5. I often follow other's opinions without expressing mine.
6. I have confidence in myself to be able to accomplish my goals in life by myself.

ATTACHMENT SCALE

Answer every item by choosing the number on which best describes how characteristic or uncharacteristic it is as it applies to your father and mother.

1) very uncharacteristic
2) slightly uncharacteristic
3) neither characteristic or uncharacteristic
4) slightly characteristic
5) very characteristic

1. When I was a child, my father played with me well.
2. My father enjoys talking about the news with me
3. My father used to take me to interesting places and talk with me about what we saw there.
4. When I was a child, my father gave me a good deal of physical affection.
5. My father always made sure he knew where I was and what was doing.
6. My father tells me his childhood and memories of his school days.
7. My father worried about the bad and sad things that could happen as I grew up.
8. My father asked me about my boyfriend/girlfriend.
9. When I was a child, my mother played with me well.
10. My mother enjoys talking about the news with me
11. My mother used to take me to interesting places and talk with me about what we saw there.
12. When I was a child, my mother gave me a good deal of physical affection.
13. My mother always made sure she knew where I was and what was doing.
14. My mother tells me her childhood and memories of her school days.
15. My mother asked me about my boyfriend/girlfriend.

ADHERENCE

1. How often do you take pills?

    1) always
    2) sometimes
    3) never

2. What are you doing for activity restrictions?

    1) always follow prescriptions
    2) sometimes follow prescriptions
    3) never follow prescriptions

3. What are you doing for diet restrictions?

    1) always follow prescriptions
    2) sometimes follow prescriptions
    3) never follow prescriptions

SCHOOL ABSENCE

1. How often were you absent from school in a past year

    1) within a week
    2) 1 week to 1 month
    3) 1 to three months
    4) more than three months

CLUB ACTIVITY INVOLVEMENT

1. Do you do any club activities?

    1) yes, I participate in a sports oriented club
    2) yes, I participate in a culture oriented club
    2) no

FREQUENCY OF CLINIC VISIT

1. How often do you visit clinic?

    1) once a week
    2) every two weeks
    3) every month
    4) every 6 to 8 weeks

HOSPITALIZATION EPISODE

1. Were you hospitalized in the past year?

    1) yes
    2) no

GRADUATE SCHOOL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
DISSERTATION APPROVAL FORM
DOCTOR OF SCIENCE IN NURSING

Name of Candidate Mitsue Maru

Major Subject Maternal Child Health Nursing

Title of Dissertation Alcohol and Tobacco Use in Japan Among Adolescents With Chronic Kidney Disease

I certify that I have read this document and examined the student regarding its content. In my opinion, this dissertation conforms to acceptable standards of scholarly presentation and is adequate in scope and quality, and the attainments of this student are such that she may be recommended for the degree of Doctor of Science in Nursing.

Dissertation Committee:

Name		Signature
Dr. Carol Dashiff	**, Chair**	Carol Dashiff
Dr. Kathleen Brown		Kathleen Brown
Dr. Anne Turner-Henson		Anne Turner-Henson
Dr. Jan Wallander		
Dr. Malcolm Turner		Malcolm Turner

Director of Graduate Program Carol Dashiff

Dean, UAB Graduate School Joan F. Lorden

Date 12/9/99