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**Hardy, Jean Ann**

**AN EXPLORATORY STUDY OF FEMALE URINATION**

*The University of Arizona*

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AN EXPLORATORY STUDY OF  
FEMALE URINATION

by

Jean Ann Hardy

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A Thesis Submitted to the Faculty of the  
COLLEGE OF NURSING  
In Partial Fulfillment of the Requirements  
for the Degree of  
MASTER OF SCIENCE  
In the Graduate College  
THE UNIVERSITY OF ARIZONA

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STATEMENT BY AUTHOR

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APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

Margarita Kay  
Margarita Kay  
Professor

13 March 1985  
Date

This study is dedicated  
to my sons, Dave and Jim,  
for their encouragement  
and loving support.

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## ABSTRACT

This study explored the voiding beliefs and practices of self-acclaimed healthy, nulliparous women and the occurrence of urinary tract infection. Ten women between eighteen and thirty-four years of age were interviewed using open ended questions to learn how normal women accomplished urination.

Findings revealed that nine of ten informants had had at least one urinary tract infection, and four informants were currently experiencing symptoms of mild stress incontinence. Six of the ten informants stated that postponing and stopping voiding behavior were part of their usual daily voiding pattern. These six informants have had a total of 52 urinary tract infections. An addition finding was that stopping the flow of urine with Kegal Exercises was significantly associated with the occurrence of mild stress incontinence ( $p=.05$ ).

## CHAPTER I

### INTRODUCTION

Normal female urination is a phenomenon which is not understood by health care providers. It has never been studied. Two possible reasons for the lack of documentation on normal female voiding are: 1) women themselves are unaware of how they accomplish urination and 2) abnormal female urination or female urinary dysfunction has been researched extensively without learning what women refer to as normal voiding. The present study determined how women say they urinate by exploring three phases which comprise the voiding process: 1) initiating urination, 2) maintaining a urinary stream, and 3) emptying the bladder. It will also explore personal and social aspects of the informant's voiding practices such as smoking and drinking habits, work, recreation and personal relationships.

Literature supports this researcher's observations in clinical practice which reveal that urinary dysfunction is common in women. The most common form of urinary dysfunction among women is urinary tract infection, which is usually the first urinary problem girls and young women develop. Other types of urinary dysfunction such as stress incontinence are more frequent among older women.

Female urination is surrounded by beliefs which have developed into a mythology. For example, young women are told to expect honeymoon bladder after they get married. Furthermore, women believe that some form of urinary dysfunction is normal during pregnancy, after childbirth, following gynecological surgery and after menopause.

Myths about female urination may be grounded in female voiding behavior. The proposed study will explore the voiding practices and beliefs of self-acclaimed healthy, nulliparous females between the ages of 18 and 40 years of age in order to learn what behaviors are practiced by women which may account for the high incidence of urinary dysfunction in women.

Prevention of female voiding behaviors which lead to urinary dysfunction is the overall objective of this research. By learning what women consider to be normal voiding behavior, methods can be developed which will assist women with learning new voiding behaviors.

The study will reveal what women consider to be normal voiding behavior. It will also reveal what women do to initiate urination and maintain voiding. Finally, it will reveal how women empty their bladders of urine.

#### Statement of the Problem

What are the voiding beliefs and practices of self-acclaimed healthy, nulliparous females?

### Statement of the Purpose

The purpose of this study is to learn how a convenience sample of women have been accustomed to voiding by discovering: 1) what women do to initiate voiding, 2) what women do to maintain the flow of urine, and 3) how women empty their bladders of urine. The study explored personal and social aspects of the informant's voiding practices such as smoking and drinking habits, work, recreation and personal relationships. A second purpose was to learn if there are specific voiding behavior patterns which may be associated with the occurrence of urinary tract infection, in order to suggest preventive measures.

### Definitions

1. Voiding beliefs: Statements made by women about their urination.
2. Voiding practices: The urination activities as documented in the log and in the interviews.
3. Self-acclaimed healthy: Statements by subjects.
4. Nulliparous: Has never delivered a child.

### Significance of the Problem

Recurrent urinary tract infections are one form of urinary dysfunction which affects large numbers of women. Accurate statistics are not available on the incidence of recurrent urinary tract infections because ambulatory patients are treated in physicians' offices, and these infections are not among the diseases which are reportable by law.

However, the occurrence of recurrent urinary tract infection is frequent enough to be recognized by The Pan American Health Organization (1983, p. 3) as a major female medical problem. Furthermore, undetected urinary tract infections are credited with causing pelvic inflammatory disease (PAHO, 1983, p. 4).

If the present study reveals that women use voiding behaviors which are associated with urinary tract infection, methods aimed at preventing those behaviors can be developed. Community Health Nurses have taught women how to decrease contamination from the rectum to the urethra by using a front to back tissue drying method. However, the present study may reveal additional information which nurses can use in order to help women prevent urinary tract infections. Also, by reaching women prior to childbearing and gynecological surgery, some of the myths surrounding the urinary system can be dissolved and predisposing habits leading to health problems may be prevented.

### Conceptual Orientation

The conceptual orientation includes two female voiding behaviors which have been identified as causal factors in the occurrence of urinary tract infection. These behaviors are postponing voiding (Marchant, 1980) and hurrying to finish voiding (Stewart, 1979). The data may also suggest that there are other voiding behaviors used by women which predispose to the occurrence of urinary tract infection. The present study will learn how women void, based on their description. The study will also learn if women use behaviors which put them at risk for developing urinary tract infections.

Female voiding is explained behaviorally, culturally and physiologically. Each explanation is important to this study because the act of urination is a physiological function which women cognitively control. Voluntary control is evident during each phase of the voiding process: 1) initiating urination, 2) maintaining the stream, and 3) emptying the bladder of urine. Consequently, behaviors which women use may influence their ability to initiate, maintain or complete the voiding process.

The background to the study of female urination has four aspects: 1) what is known about female voiding in general, 2) why female voiding practices are different from male practices, 3) what voiding practices or behaviors are detrimental, and 4) what relationship is known or postulated between the detrimental voiding behaviors and urinary dysfunction?

#### What is Known About Female Voiding in General

Female voiding behaviors are interrelated with female anatomy and cultural norms. The bladder is a hollow, muscular, pelvic organ. The female bladder lies anterior to the vagina and the uterus. The constant formation of urine by the kidneys is collected in the bladder until a woman has the urge to void. An average bladder capacity is 300-500 ml of urine, but during periods of severe distention the bladder is capable of containing up to 1500ml of urine (Smith, 1981). Bladder capacity varies among individuals, but chronic distention can lead to a desensitization of the muscle wall resulting in bladder atonia (Raz, 1979).

Normal urinary control and voiding are the result of complex interactions of smooth muscle, voluntary muscle, cerebral inhibition and the autonomous nervous system (Merck Manual, 1982, p. 1593). Ganong (1983) defines urination as a spinal reflex, facilitated and inhibited by higher brain centers (p. 587).

Urine enters the bladder without producing much increase in intravesical pressure until the bladder is well filled. During micturition, the perineal muscles and external urethral sphincter are relaxed, the detrusor muscle contracts; and urine passes out through the urethra. The mechanism by which voluntary urination is initiated remains unsettled. One of the initial events is relaxation of the muscles of the pelvic floor, causing a downward tug on the detrusor muscle to initiate its contraction (Ganong, 1983, p. 587).

The perineal muscles and external sphincter can be contracted voluntarily, preventing urine from passing down the urethra or interrupting the flow once urination has begun. Furthermore, the bladder can be made to contract when it contains only a few milliliters of urine by voluntary facilitation, and voiding can be initiated without straining even when the bladder is nearly empty (Ganong, 1983, p. 588).

Goroll, May and Mulley (1981) describe urination in the normal individual as a process which begins with a sensation of bladder fullness mediated by sensory nerves in the bladder wall. The bladder muscle, detrusor urinae, contracts causing urination to begin. "Detrusor contraction is initiated via a parasympathetic reflex arc. The urethra is mechanically oriented to the bladder so as to facilitate continence" (Goroll, et al, 1981, p. 501).

### Why Female Voiding Practices Are Different From Male Practices

It is important to note that there are differences between male and female voiding practices because urinary tract infection in

children and young adults is a female problem (Baden & Thornton, 1980). The differences between male and female voiding behaviors are well developed by the time children are three years of age. By the time they are toilet trained, they are old enough to consciously suppress detrusor activity. Little boys stand to void. They initiate voiding and maintain voiding by straining with abdominal muscles. At the end of urination, they empty their urethras of urine by voluntary muscular contractions which expel the remaining urine. The male urethra is 20 cm long. By contrast, the female urethra is only 3.5 cm in length. Emptying of the female urethra takes a longer time because it is emptied by gravity. Although the male urethra is longer, holds more urine and is emptied by forceful voluntary contractions, the process is faster for boys which results in complete bladder emptying with each urination (Smith, 1981). Girls must wait for all urine to dribble out because, as stated above, the female urethra empties by gravity. Failure to wait for all urine to be emptied could result in urine soiled underwear or a conscious behavior of contracting the pelvic muscles which leads to habitual retained urine volumes.

Little girls' voiding behaviors develop along a different line from those of little boys. Girls sit to void, will use abdominal muscles to initiate voiding at the same time that they relax pelvic muscles, and they develop habits of postponing voiding as long as possible. This may be because in American Culture boys are taught to be less inhibited than girls, and when they have the urge to void they have less of a problem finding a place to relieve themselves.

Postponing voiding may become habitual in girls because it is often inconvenient for them to empty their bladders.

Two voiding practices or behaviors of women are detrimental. Both postponing voiding and hurrying to finish voiding have been identified in the literature as behaviors which lead to urinary tract infection (Marchant, 1980; Stewart, 1979). A third behavior, straining, has been observed in the clinical setting. Furthermore, straining behavior has been observed during each of the three phases of the voiding process: 1) initiating, 2) maintaining, and 3) emptying. The literature states emphatically that straining behavior at the beginning of urination is a causal factor in the development of urinary stress incontinence (Hinman, 1971; Marchant, 1980). However, there is no mention of straining behavior either during or at the end of urination.

Habitual postponing of urination leads to retention (Marchant, 1980). Bladder decompensation occurs with prolonged retention and can lead to poor functioning of the detrusor muscle (Raz, 1979). The detrusor muscle becomes weakened after prolonged periods of overstretching. Thus, a poor functioning detrusor muscle will result in incomplete bladder emptying.

Hurrying to finish voiding results in failure to completely empty the bladder and urethra of urine at each voiding and can result in repeated retained residual urine volumes. A residual urine volume of 25 ml is clinically significant for the development of a urinary tract infection (Fair, McClennon & Jost, 1979). The significance of

this voiding behavior is that women consciously suppress the urge to void at the end of urination and eventually believe that they empty their bladders during each urination. The important aspect is that hurrying and suppressing the urge to void at the end of urination then leads to retained residual urine. Retained residual urine volumes precede recurrent urinary tract infections, (Fair, et al., 1979).

Women may ignore changes in urinary functioning and not seek medical help until a serious problem exists. It is postulated that: 1) women are unaware of when their bladders are empty, and 2) women do not know how to completely empty their bladders of urine.

The literature supports the fact that women do not empty their bladders. Subjects in Williamson's (1980) study were asymptomatic urologically, yet they all had preoperative retained residual urine volumes which ranged from 4.25 ml to 17.25 ml of urine. Normal detrusor activity should result in complete bladder emptying at each urination (Marchant, 1980). Complete bladder emptying should occur as long as urination is not prematurely stopped.

The fact that women are either unaware of urinary changes such as failure to empty their bladders completely, or that they ignore urinary changes is supported in a study by Hutch. Hutch's (1972) urinary screening study revealed that of 4,211 young never pregnant women, 50% had some degree of urinary dysfunction and 16% had a urological problem.

The relationship of female voiding behaviors to the development of urinary tract infection is a second purpose of this

study. As explained in the Statement of the Purpose, the voiding process has three aspects: 1) initiating urination, 2) maintaining the flow of urine, and 3) emptying the bladder. Each aspect of the voiding process can be interrupted. According to Ganong (1983), detrusor activity can be completely inhibited at the cerebral level for a matter of time. The fact that female urination is under voluntary control means that the behaviors can be changed if any are shown to be detrimental or associated with urinary tract infections.

#### Summary

The purpose of the current research relating to voiding behavior of women has been discussed: 1) how women initiate urination, 2) how women maintain the flow of urine, and 3) how women empty their bladders of urine. The significance of the study for women is to increase each woman's awareness of her urinary patterns and ultimately to learn ways of preventing urinary tract infections. The significance of the study for nursing is to provide information concerning female voiding behaviors which will assist nurses in developing new teaching content for preventing urinary tract infections in women. Nursing's goal for community health is to acquire new knowledge and incorporate it into the nursing process in order for that knowledge to improve the health of the community. The next chapter will summarize concepts of female bladder function and dysfunction, and present a selected literature review relevant to female urination.

CHAPTER II  
LITERATURE REVIEW

This chapter will review concepts of female bladder function and dysfunction and present a selected literature review of female urination.

Female Bladder Function

A literature search has failed to reveal studies which explain normal female voiding behaviors. Female voiding behaviors are alluded to in few articles. Normal female urination has three phases: 1) initiating urination, 2) maintaining the flow of urine, and 3) emptying the bladder of urine. The first phase, initiating urination, has been explained physiologically, but not behaviorally. The two physiological theories which explain initiating urination are:

1. Just prior to voluntary urination there is relaxation of the pelvic muscles. This may cause a sufficient downward tug on the detrusor muscle which initiates detrusor contraction (Smith, 1981).

2. Just prior to voiding, the bladder base flattens, the posterior urethrovesical angle widens, and the angle of inclination in the female urethra becomes more negative (Hinman, 1971).

The second phase of normal female urination is maintaining the flow of urine. The literature search has not revealed studies on what women do to continue urination until the bladder is empty, only that an intact, functioning detrusor muscle should result in complete bladder emptying at each urination (Marchant, 1980).

The third phase of normal female urination is emptying the bladder of urine. Except for articles found in the literature of Women's Studies which suggest that women should take the time to empty their bladders, there is no documentation in the literature on how a woman accomplishes bladder emptying.

#### Female Bladder Dysfunction

The literature does suggest that specific voiding behaviors are linked to the development of urinary dysfunction. The following four female voiding behaviors have been linked to urinary dysfunction:

1. Postponing voiding leads to urinary retention (Marchant, 1980).
2. Hurrying to finish voiding results in failure to empty the bladder (Stewart, 1979).
3. Straining to initiate urination can cause a urethral detachment from supporting tissue (Hinman, 1971).
4. Ignoring changes in urinary functioning prevents women from seeking medical help until a serious problem exists (Hutch, 1972).

The most common form of urinary dysfunction in females is urinary tract infections. The significance of learning how normal women urinate is important since large numbers of women develop

urinary tract infections. Although actual numbers are not available, the occurrence of urinary tract infections is frequent enough to be recognized by the Pan American Health Organization as a major female medical problem (PAHO, 1983, p. 3).

Temporary loss of bladder control is commonly called stress incontinence. Figures have been estimated for Americans who have bladder control problems, but this figure includes both men and women and persons who have neurogenic bladders as well as women who have stress incontinence. According to Help for Incontinent People (The Hip Report), there are "an estimated 10 million Americans who have bladder control problems" (Jeter, 1983).

#### Selected Literature on Female Urination

A literature search of Women's Studies revealed three articles. Stewart's (1979) book on women's health includes a chapter on the urinary system. The author describes the anatomy involved and certain disease conditions such as diabetes which contribute to a woman developing bladder infections by decreasing her resistance to infection. Cultural factors which may predispose to urinary tract infections include vigorous sexual intercourse and failure to urinate frequently. Hygiene habits and suggestions for preventing urinary tract infections such as drinking cranberry juice are included in this book on women's health.

Baden and Thornton (1980) devote a chapter of their book to the female urinary system. Recurrent urinary tract infections, prepubertal dysfunction, frequency, stress incontinence and surgical

repairs are discussed. Urinary dysfunction prepubertal may be due to congenital anomalies or vesicoureteral reflux malfunctioning (Baden & Thornton, 1980, p. 137). The authors also state that urinary tract infections occur during the sexually active years, but that serious disease is rarely found during urological evaluation (Baden & Thornton, 1980, p. 138).

Ehrenreich and English (1973, p. 89) discuss female complaints and disorders such as menstrual problems and difficulties during pregnancy. Voiding is mentioned as it relates to the reproductive system. Their discussion is from a perspective of the control women have over their own bodies, and the social options which repress women. One social option is accepting that urinary dysfunction is part of being female.

Urinary tract infections have been discussed from four aspects, occurrence, cause, treatment and prevention. Urinary tract infection is an infective process, the occurrence of which is dependent on an organism, a host and an environment conducive for growth. The conducive environment is retained residual urine. The literature does not explain what some women do to prevent retained residual urine or why some women have never had a bladder infection. It may be that the problem is that most women are unaware that they do not empty their bladders. Urination can be interrupted at any time, and if a woman is in a hurry to finish voiding it seems reasonable to assume that she could habitually retain a small amount of urine.

Twenty-five ml of retained residual urine is clinically significant for the occurrence of bacterial growth (Fair, et al., 1979).

#### Summary

The community health problem addressed in this chapter is a female problem that could affect all women. An extensive literature search has failed to reveal any studies on the voiding beliefs and practices of women. Once patterns of female voiding behaviors have been identified, methods aimed at preventing common forms of urinary dysfunctioning can be developed. The next chapter will describe the design and methodology that will be used to study the phenomenon of female voiding behavior.

CHAPTER III  
DESIGN AND METHODOLOGY

This chapter presents the design and methodology that was used to study the phenomenon of female voiding behavior. A description of the sample, the protection of human rights, and a discussion of the measurements and estimations obtained were presented. The techniques of data analysis and the limitations of the study were also included.

Design

An exploratory design was used to learn how women urinate. Data collection consisted of three phases, 1) a urinary history interview (Appendix B), 2) a 24 hour log of all fluids consumed and all urine excreted (Appendix C), and 3) a second interview after the log had been recorded in order to collect any additional data on urination which the subject became more aware of when she was recording her fluid intake and output. The taped interviews contained open-ended questions on how each subject 1) initiated urination, 2) maintained her flow of urine, and 3) emptied her bladder of urine. A third interview took place one month later in order to collect additional data which the informants were aware of. All data were taped and transcribed.

### Setting and Sample

Ten informants were interviewed by the investigator in each subject's home. Subjects were women who met the following criteria:

1. Eighteen to forty years of age.
2. Self accalimed healthy status.
3. Absence of confirmed urinary pathology.
4. Never delivered a child.

The above criteria were selected based on literature findings of the occurrence of urinary tract infection, the purpose of the study, and previously stated female mythology. Baden and Thornton (1980) state that urinary tract infections in females occur during the sexually active years. The purpose of the study is to learn how women are accustomed to voiding. The female mythology stated earlier is that women believe that some form of urinary dysfunction is normal during pregnancy, following childbirth, after gynecological surgery and after menopause.

### Protection of Human Rights

This study was submitted and approved by the College of Nursing Ethical Review Committee. The human rights aspect of this study was addressed in the following manner.

The investigator explained the purpose of the study to each subject and she was provided with a written copy of the disclaimer (Appendix A). Each subject was informed that there were no known risks involved, but that sharing data on female urination behavior may contribute to understanding of this phenomenon in the future.

Expectations were that three taped interviews were to be conducted in each subject's home. Oral consent was obtained.

The first interview contained open-ended questions concerning the subject's urinary history (Appendix B). Following the interview the subjects were instructed in keeping a 24 hour fluid intake and urinary output log (Appendix C). A second interview, after each subject had finished her 24 hour log contained open-ended questions about the subject's personal-social life as it related to her urination. A third interview was scheduled for one month later in order to obtain any new data which the subject became aware of.

Subjects were given the freedom to answer only those questions which she wished to answer and that she was free to withdraw from the study at any time without incurring ill will. No names were collected. Subjects were informed that data are available to the investigator, the thesis committee and the College of Nursing.

#### Data Collection

Data were collected during August, September and October, 1984. Information was obtained by starting with open-ended questions followed by focusing the interview when more details were needed. The focus of the interviews was on female urination. Each interview followed the general guidelines for obtaining a Health History as described in the Syllabus: Preparation for Clinical Medicine University of Arizona College of Nursing (Levinson, 1984). Information on the informant's present urinary history was obtained by following the Interview Guide (See Appendix B).

The Interview Guide directed the interview to four specific areas: 1) present, 2) past, 3) family history, and 4) personal-social. Questions on the present history included the following. How do you urinate? How much do you urinate? Is it different at certain times of the day? How do you get your urine started? Does anything make it easier? Harder? What other sensations are you aware of during and at the end of urination? Questions on past history dealt with the informant's medical history which included urinary problems and urinary tract infections. Family history questions focused on urinary problems in immediate family members. Personal-Social questions focused on habits, work, recreation and relationships with others as they affected the informant's normal pattern of urination.

At the end of the interview, informants were asked to keep a log for 24 hours (See Appendix C) on their fluid intake and urinary output in order to obtain as much objective measurement as possible. The informants were asked to record the time, amount of fluid intake and measured urinary output in order to learn the fluid consumption of the informants, and to answer how much and how often the informants urinated. The informants recorded the color and odor of their urine which suggested adequate or inadequate hydration levels. Each informant was also asked to record any subjective data that they were aware of when initiating urination, during urination and at the end of urination in order to obtain as much information on the informant's behaviors when voiding as possible.

Finally, informants were reinterviewed on two separate occasions, after their 24 hour log, and one month later in order to share any additional subjective data which did not emerge during the first interview.

### Data Analysis

Urinary history and interview aspects of each interview were fulfilled. The history aspect included voiding practices, that is factual information about urination. The interview aspect provided information about voiding beliefs.

Data were transcribed and organized according to behaviors each women used when initiating urination, during urination, and at the end of urination. Subjects were interviewed again after the 24 hour logs had been completed, and then again one month later in order to obtain any additional data. After the data had been organized according to behaviors, any relationships among voiding behaviors and each informant's work, habits, recreation and personal relationships were explored for patterns.

Frequency distributions were presented for the variables of voiding practices of healthy women, past history of urinary tract infection, evidence of family history of urinary problems and personal-social lifestyle influences. Comparisons were made among the number of voiding practices of the ten informants as presented in completion of the 24 hour logs. Factors were identified and described that may influence voiding behaviors either to accomplish or control the voiding process. Raw data frequency estimates were presented to

describe potential detrimental voiding behaviors, occurrence of urinary tract infection, occasional loss of urine and mild stress incontinence.

## CHAPTER IV

### RESEARCH FINDINGS AND DATA ANALYSIS

The results of the study presented in this chapter include the informants' responses during the first interview, the urination history, and the 24 hour fluid intake and urinary output log. It also includes the informants' responses to the second interview, in-depth interviewing on their personal-social lifestyles, as related to urination.

The findings address the problem of this study which states: What are the voiding beliefs and practices of self-acclaimed healthy, nulliparous women?

#### Sample

A convenience sample of ten women provided the data for this research. Their ages ranged from eighteen to thirty-four years of age.

#### Findings

##### First Interview

Findings from the urination history revealed the following data. Quotations from the informants have been given verbatim or summarized.

### Present History

1. How do you urinate? Seven out of ten women stated "It just comes." Three out of ten women stated "I just relax."

2. What is your urine like? All informants stated that their urine was "yellow." Urine was described as "straw" or "light yellow." Only one informant had dark urine. Odors were described as "musty", "strong", or "it has its own special odor."

3. How much do you urinate? Four informants responded "don't know." Six informants estimated an amount ranging from "half a cup" to "200 cc."

4. How often do you urinate? Two informants stated that they "void 15 times a day." Eight informants stated that they void "from two or three times a day" to "five or six times a day."

5. Is it different in the morning? Evening? The only difference the informants were aware of between morning and evening voidings was that morning voidings were associated with "more urgency and usually the amount is more."

6. How do you get your urine started? Answers ranged from "I turn on the faucet" to "I just go." Three informants answered "I relax."

7. When do you urinate? Ten informants answered that voiding was the first thing that they did when they woke up. Two informants stated that the urge to void usually woke them up at night.

8. Anything make urinating easier? Six informants stated that "Nothing makes it easier, only the absence of infection." Four

informants said that "waiting and relaxing" or "privacy" made urinating easier.

9. More difficult? Six informants stated that "It's hard to urinate when you have an infection." Four informants said that "If I postpone urinating or if I hold my urine for a long time it's really hard to go."

10. Associated symptoms? All informants were aware of pressure prior to urination, relief following urination and environmental factors which inhibited urination. Some environmental factors such as swimming in cold water, acted as a stimulant for urination.

11. How do you clean yourself afterward? Eight of ten informants stated that they used an accepted method of tissue drying with a front to back motion. One informant stated "I wipe from back to front." One informant just blots her perineum.

#### Past Urinary History

Have you ever had any problems with urination such as infection? Burning? Losing urine?

Nine of ten informants have had at least one episode of medically diagnosed and treated urinary tract infection. The women described their symptoms as "frequency, burning and painful urination." Nine informants also stated that they had had episodes of losing urine from "a few drops" to "a lot of urine." The circumstances surrounding these episodes of urine loss ranged from a childhood urinary tract infection to urinary problems following abdominal surgeries (appendectomy or ovarian, not urinary) to occasional stress

incontinence with sneezing or laughing. Four of ten informants are currently experiencing signs and symptoms of mild stress incontinence.

#### Family History

Has anyone in your family had a urinary problem?

Only one informant had no family history of urinary problems. Six of ten informants stated that their mothers or sisters have had urinary tract infections. Three informants stated that their mothers have "retention" or "stress incontinence problems."

#### Personal-Social

Questions on the informant's personal-social lifestyle included questions relating to habits, work, recreation and relationships as they influenced urination.

Habits. The informants were asked questions about fluid intake, alcohol consumption, smoking and the use of street drugs.

All of the informants stated "If I drink a lot of fluids I have to go more often." "The more I drink, the more I go to the bathroom." One informant consistently limits her daily fluid intake, "I don't want to be bothered by the urge to urinate."

Two specific types of fluids acted as stimulants for the informants, coffee and alcohol. "If I drink two cups of coffee, I know I have to urinate in an hour." "I usually drink coffee at my desk and I probably go three or four times before lunch." The second type of fluid which acted as a stimulant for the informants was alcohol. The informants stated "alcohol increases my urination." "When I'm

drinking, I pee all the time." "My boyfriend gets mad at me, cause I spend half the night in the bathroom." "I can't hold my urine as long when I'm drinking alcohol." Five informants drank only mixed drinks, whereas four informants drank mostly beer. Only one informant drank wine. Consumption ranged from twelve beers a week to one or two drinks a month. None of the informants consumed more than four drinks during a twelve hours period. One informant stated that alcohol changed her urine. "Alcohol has a tendency to make my urine more dilute. Once I start to urinate and make my first trip to the bathroom, I have to go every fifteen minutes until I stop drinking."

Two informants are smokers and they stated that "smoking by itself has no effect on urination, it's just that when I'm drinking alcohol I smoke more." One informant occasionally smoked marijuana. She stated that "the use of pot has no effect on urination." None of the informants claimed to use other street drugs.

Work. Each informant was asked how work affected her urination. Questions included "Are you on your feet all day?" "Does your work take you outside?" "Do you sit at a desk?" "Are there bathroom facilities available at work?"

Four of the informants stated "I'm on my feet all day at work." Six of the informants stated that work was a combination of sitting at a desk for the main part of the day and having to travel to another location outside of their offices for the rest of the day.

All of the informants had bathroom facilities available at work, but they were more likely to postpone the urge to void if they

were at work. In the home environment the informants usually voided within fifteen minutes after they had the urge to void.

There was no indication of changes in urination whether the informant's work demands required a seated or a standing position. A difference was noted however, if her work permitted her to consume coffee at her desk.

Recreation. The informants were asked questions about the relationship between recreation and urination. All of the informants were physically active. A few of the activities they participated in were jogging, swimming, tennis and softball.

Questions included "What effect does recreation have on your urination?" "Does being physically active change how you urinate?"

Four informants stated "I don't think about it." Six informants stated "I just go before."

Relationships. Each informant was asked how sexual relationships affected her urination.

Two informants stated that they "didn't know." Three informants said "It doesn't make any difference." The remaining five informants stated that they always voided just before or shortly after having sex and that their "urine is just like always."

#### Phases of Urination

The urination history interview was followed by in-depth open ended questions on the three phases of urination. Each phase, 1) initiating urination, 2) maintaining a stream, and 3) emptying the bladder of urine, resulted in lengthy discussions.

### Initiating Urination

Initiating urination for all of the informants was preceded by an awareness of "urge to empty my bladder." Three of ten informants stated "I usually go anywhere from fifteen minutes to an hour after I feel the urge to go."

Six of ten informants stated "I can wait three or four hours without any problem." "I know I'll be home in a few hours, so I usually wait." "It all depends, if I can't leave the person I'm working with, I may have to wait until my shift is over." "If I'm making house calls, I can wait eight or ten hours."

One informant stated "I have real good control over my bladder. I just put it off. If I don't go at dinner time, I just wait until the next morning."

Once the decision to urinate was made, the informants described the urge as "my bladder's full." "I can't hold it any longer." "There's fluid--liquid inside of me." "First it tingles and then it turns to pain." "There's a looseness in my abdomen, and there's pressure above my pubic bone." "It's a hard lump, and it hurts any way I move." "It's a combination of pressure and a full feeling in my lower abdomen."

The first phase of the voiding process, initiating urination, was hard for the informants to explain. Although they were very aware of sensations prior to starting urination, when it came to producing urine it wasn't something they consciously did. The informants stated that they "waited", "it just started", "I don't help

it", "it just comes." Only one informant stated that she "usually waits a long time" and "when I go to the bathroom, I can't get the urine started so I push with my stomach muscles and bear down a little." She also stated, "If that doesn't work, I just wait a few hours and try again."

The informants explained starting urination as "I just turn on the faucet" (figuratively speaking), "sit and wait -- relaxing inside and outside", "I don't do anything -- just sit." "It takes a while, sometimes I sit forever." "I'm a quick pee-er, it comes out as soon as I sit down." "It comes out fast and forceful; I want it out -- get rid of it."

#### Maintaining a Stream of Urine

It was easier for the informants to explain the second phase of the voiding process, maintaining a stream of urine. This phase took a longer time to accomplish, and they were more aware of what was happening. "When the urine is coming out I relax all of my muscles." "My stream is narrow, it goes forward and down, it's warm." "Basically, it's a major sense of relief." "God, what a relief!" "I go slowly, usually I put my hands on the toilet seat and push up a little. It makes it come out slower that way. I figured that out once when it hurt so much to go. If it's slower I'm not afraid that it will hurt." "Once it starts I can't stop it." "Everything relaxes and I can't feel the pressure any more." "I bear down to keep it going fast cause I'm in a hurry."

### Emptying the Bladder of Urine

The third phase of the voiding process is the end of urination. Women were asked how they knew that they were finished. They were also asked what they did to finish urinating. The responses indicated that women were aware of the change in their stream near the end of voiding, but that they usually didn't do anything to make it finish. Further questioning revealed that three of the informants waited until urine had stopped dripping and then they used abdominal and pelvic pushing behavior "to get the last bit out."

The informants' comments on the third phase of the voiding process focused on the absence of pressure and a change in the stream. "I don't have the sensation anymore, it just finishes after the last drip." "It's funny, it always takes longer than I think it should." "I'm through when no more comes out. I always wait though, because if it's not all out, I just have to go an hour later." "It just stops. It takes two or three seconds, but the end just dribbles." "My urine slows down, drips and then stops. All of a sudden the pressure is gone, I feel relief and my muscles start tightening back up." "When I'm done, it just abruptly stops and then I contract my muscles." "I listen to my pee, it trickles at the end, and I wait to hear the last drop. When I'm in a hurry though, I just hope I'm done." "Funny, sometimes I think I'm done and I turn to get tissue and all of a sudden there's forceful urination again."

### Data From the Twenty-Four Hour Log

Data recorded in the 24-hour fluid intake and urinary output log showed that an increased fluid intake resulted in an increased urinary output. The informant with the greatest total fluid intake (1500 cc) had the greatest number of voidings (11) and the greatest total urinary output (2245 cc). The informant with the least total fluid intake (270 cc) had the fewest number of voidings (two) and the least amount of total urinary output (650 cc).

Relationships between fluid intake and urinary output were not conclusive. Five of the informants produced more urine than their recorded intake of fluids. The range of urinary output was from 380 cc to 745 cc more than fluid intake. The other five informants produced from 200 cc to 265 cc less urine than their recorded fluid intakes. The number of voidings during a 24 hour period closely paralleled what the informants had previously stated that they voided.

None of the informants reported any color change in their urine from the previously stated yellow color. Nor was there a difference in odor from what had previously been reported. As was expected, all of the informants voided on first awakening. Two of the informants were awakened in the night by the urge to empty their bladders. The nighttime amounts, 300 cc and 325 cc, reflected their usual amount of voided urine.

### Second Interview

The logs provided numerical data on the amount of fluids consumed and the amount of urine voided. After keeping the 24 hour

log, informants were reinterviewed in order to obtain in-depth information on the four aspects of their personal-social lifestyles which may affect their urination and/or voiding behaviors. The interviews that followed keeping the logs provided new and richer data due to each informant's increased awareness of her own urination process. Whether she was at work or at home, whether she was participating in a physical activity or watching television, each informant was more likely to listen to her body and urinate shortly after feeling the urge to void. During the interviews it became apparent that specific circumstances caused the informants to change their voiding behaviors. The interviews also provided additional data on when and why specific voiding behaviors were used.

The second interview also revealed that detrimental voiding behaviors were occasionally used by all of the informants. These behaviors included postponing urination, hurrying to finish voiding, and abdominal and pelvic straining. Detrimental voiding behaviors were evident as part of the usual voiding practices in six of the informants.

Data from the second interviews were analyzed according to the behaviors the informants used. These data answered the following two questions. When do women use certain voiding behaviors? Why do women use certain voiding behaviors?

Voiding behaviors of the informants were affected by the following factors: 1) other people, 2) the environment, 3) the amount

and type of fluids consumed, and 4) the activity level of the informants.

#### Other People

Other people were an inhibiting factor for the informants' urinations. "Everybody knows where you're going." "I try to pee slow so I don't make a lot of noise." Even though all of the informants had available bathroom facilities at work, other people in the work environment inhibited four of the informants. "I'd rather not go at work." "Sometimes there's other people in the bathroom." "I just wait till I'm home." "I've trained myself to only go once a day at work -- usually at lunch." The presence of a spouse or significant other removed all inhibition for two of the informants. "I don't even shut the bathroom door." "There's nothing left to be embarrassed about."

#### Environment

The environment was both an inhibiting and a stimulating factor for the informants' urinations. The work environment made the informants feel as though they had to hurry in order to get back to the phone or their desk. The need to hurry urination or postpone urination was stated "I hate to waste the time." "I really hurry because I can't hear the phone." "I only go at lunch." "At work, I just wait." "It has to be timed." "It's a tight schedule, I have to fit it in." "I just ignore it." "I've trained myself to only go once a day at work -- usually at lunch." "I just postpone it and limit my

fluids." "I try not to drink too much coffee at work because I know I'll just have to go to the bathroom before lunch."

The environment also inhibited the informants if voiding meant using a public restroom or going to the bathroom outside. The most frequently mentioned problem was a dirty bathroom. Six of the informants adapted their behavior and either covered the seat with tissue or straddled the commode and urinated. One informant, however, holds her urine and refuses to use a public bathroom at all. "I can't go in a public bathroom." "I just wait, no matter how long it takes."

Urinating outside was something all of the informants had done on occasion. What inhibited the informants was where they were outside, and if other people could see them. Consequently, parks, playgrounds, picnic areas and places where she may be in someone's view or someone could walk up on her while she was voiding were unacceptable places. Seven informants stated that they would use an outside bathroom "only if I really have to go bad." Three of the informants simply held their urine "until I get home."

When voiding outside was unavoidable such as long car trips or camping, eight informants felt comfortable seeking a private place where they could empty their bladders. One informant said that she has "not had to empty my bladder outside since I was about ten years old." One informant stated "If I really have to go bad and I'm in pain, I'll get out of the car and just let enough urine out so the pain goes away, and then I can hold the rest for three or four more hours."

Sometimes the environment acted as a stimulus for urination. Four of the informants said that "being in the cold air or swimming in cold water" made them want to urinate. One informant said that "warm air" made her want to urinate.

#### Amount and Type of Fluids Consumed

Coffee and alcohol increased urination for all of the informants. Comments included: "If I drink a lot of coffee, I urinate more frequently." "When I'm drinking, the beer goes right through me." "I go every fifteen minutes." "Beer, wine, mixed drinks, it doesn't matter, the alcohol just makes me pee." "I can't hold my urine very long if I'm drinking beer."

#### Activity Level

Activity level was categorized into two categories, athletic activity and sexual activity.

Athletic Activity. Athletic activity acted as an inhibitor for eight informants. Comments were: "When I'm doing sports I don't have the feeling." "It's the last thing I think of." "I'm too busy having fun." "I'm outside and there's no place to go anyway." "I go before and then I'm empty." "When I start to run, I have the urge, but it goes right away." "Exercise makes my urine lighter." "I burn up all my fluid."

Athletic activity was a stimulant for two of the informants. "When I get back from biking I really have to go." "Sometimes I lose urine when I'm active."

Sexual Activity. Sexual activity and its relationship to urination depended on the sexual experience of the informant. Most of the informants were sexually active. Three of the ten informants stated that "I usually void before I have sex." "It's a habit." "If I don't go before, I'll just have to go an hour later." Six informants stated that "I usually empty my bladder after having sex, but it's part of keeping clean and it helps to prevent urinary tract infections. I don't feel any pressure or urge to urinate." "Sex doesn't make me have to go unless I've got a full bladder." "It's just a habit, I go before and after." "I want to go after sex, I feel cleaner." "I always have to go after sex, but it's because I didn't go before." "I don't know if sex affects my urination or not, I just go after having sex. I always have."

One informant stated "I usually don't void after having sex, but the next morning I notice some difficulty getting urine started and the force of my flow is increased." This was a one time morning occurrence which subsided by the next voiding.

One informant attributed a urinary tract infection following intercourse to "not being sufficiently lubricated."

#### Voiding Behaviors

The informants in this study used numerous behaviors to control or accomplish voiding. The behaviors were stated "I just postpone going." "I'm always in a hurry to urinate, I don't want to waste the time." "I'm in a hurry to finish so I just shut it off. I hope I'm done." "I strain with my abdominal muscles to get it

started, but then it just comes." "Sometimes I relax my bottom and push it out, just bear down." "If I know I'm going to be in class for a couple of hours, I just empty my bladder so I'm not uncomfortable later on." "If I've waited for a long time to go, I just push on my abdomen to get my urine started." "If I wait and relax all my muscles, my urine will start." "Sometimes I think I'm all done and when I turn and reach for tissue, forceful voiding starts all over again."

The women who hurried to either accomplish the voiding process or to finish voiding were also the same women who postponed voiding. "I just don't have the time to go." "I can't sit there all day." When they finally did decide to urinate, they had difficulty starting their stream and would use straining behaviors to produce urine. One informant has had episodes of being unable to produce urine. She solved this by "waiting another three or four hours" and then was able to able to empty her bladder.

The usual position which the informants assumed when voiding was to sit on the seat with their feet on the floor and their backs in a slightly forward position. The informants changed their behavior if the bathroom was dirty or if they had to void outside. All of the informants used a semi-standing position if the bathroom was dirty, and they used a squatting position if they had to void outside.

A different behavior is used by the informant who has experienced the greatest number of urinary tract infections. This informant uses her hands to raise herself off of the seat in order to

slow down her urinary stream and decrease painful urination. "I just figured it out once when it hurt so much to go. Then the pain in my stomach got worse. If I just let a little bit out at a time, I am able to go."

The last voiding behavior which the informants used was stopping the flow of urine. Stopping urination is a practice used by all of the informants but only during specific times. It is a conscious behavior which is not part of their normal voiding pattern.

Women stopped their flow of urine for three reasons, the need for privacy, hurrying to get done, and doing Kegel Exercises. Four informants spoke of doing Kegel Exercises. The exercises are used by women in order to strengthen pelvic muscles. Although there is no published reliability and validity in support of the Kegel Exercises, the following description was published in a book on women's health.

Practice these exercises in order to prevent sagging organs, losing urine when you cough, sneeze or laugh, and prepare for childbirth. In order to locate the pelvic muscles, spread your legs apart while urinating and start and stop the flow of urine. The muscles can also be exercised by tightening around a man's penis or a finger. Do ten contractions twenty times a day in order to strengthen the pelvic floor and achieve increased pleasure during intercourse (Boston Women's Health Book Collective, 1979, p. 139).

The authors state that "sometime in her life, nearly every woman gets cystitis" (Boston Women's Collective, 1979, p. 139). Intercourse positions such as a rear approach which causes pressure on the bladder and intercourse after periods of abstinence are credited with causing urinary tract infections (Boston Women's Collective,

1979, p. 140). Only one informant in this study stated that her urinary tract infection was due to intercourse and "that was because I had intercourse without being sufficiently lubricated."

The four informants in this study who practiced the Kegel Exercises did them not only when they were in a seated position, but also during urination. One informant said that "my physician told me to void a little bit, stop voiding and hold my urine for one minute, continue to void a little bit and repeat the process three or four times during one urination."

Comments by the other informants were: "The exercises were part of discharge instructions to all patients when I worked on the "obstetrics floor in New York." "The exercises are supposed to make sex better." "I taught a lot of women how to do them and I decided to do them myself." Two of the informants stated that "they are very hard to do if my bladder is full. The faster the urine is coming out, the harder it is to stop. Sometimes I can't stop it."

Possible detrimental voiding behaviors and the occurrence of urinary tract infection, occasional loss of urine and mild stress incontinence are displayed in Table 1. Note that all ten informants occasionally use two detrimental voiding behaviors, postponing urination and stopping urination. As stated earlier, the informants were usually inhibited by the presence of other people or public bathrooms. However, seven of the informants also hurried to accomplish urination. They felt that they couldn't take the time from work or their activity to void. When they did decide to void, urination was

initiated and maintained by straining for four of the informants. Informant number seven only used straining behavior at the very end of urination. The other six informants who hurried urination also hurried the end of voiding by "shutting it off" or "I hope I'm done."

Also note that nine informants have experienced at least one urinary tract infection. The informants who have had three or more urinary tract infections and the number of infections they have had are displayed in Table 1. The six informants who have had three or more urinary tract infections habitually use postponing and stopping behaviors.

All of the informants used postponing and stopping voiding behaviors when they were inhibited by the presence of other people or if they were not comfortable using a particular bathroom. However, six of the informants consistently postponed urination and stopped voiding as their pattern of normal voiding behavior. Those women who habitually practiced postponing and stopping behavior had three or more urinary tract infections. As stated before, one informant has never had a urinary tract infection. The remaining informants have only had one urinary tract infection.

Table 1. Detrimental Voiding Behaviors and the Occurrence of Urinary Tract Infection, Occasional Loss of Urine and Mild Stress Incontinence (n = 10)

Informant	Number of Voidings 24 hours	Habitual Postponing	Hurrying	Habitual Stopping	Stopping With Kegel	Straining	Number of UTI's	Occasional Loss of Urine	Mild Stress Incontinence
1	4		X			X	1	X	
2	6		X				1		
3	8	X		X	X	X	4		X
4	2	X		X			25	X	
5	7	X	X	X	X	X	4		X
6	11	X	X	X	X	X	3		X
7	6		X			X	0		
8	11						1		
9	9	X	X	X	X		8	X	X
10	7	X	X	X			5		
Totals	71	6	7	6	4	5	52	3	4

### Statistical Analysis

The final step in analysis was to subject the data to statistical treatment in order to supplement the descriptive data. Spearman  $r_{\rho}$  was selected as the most appropriate test for the data. Spearman  $r$  is a non-parametric test which is used to determine a correlation when both scales are expressed as ranks.

Since two voiding behaviors, postponing and stopping, were used by all of the informants, these categories were deleted from statistical analysis. Three detrimental voiding behaviors, 1) hurrying, 2) stopping with Kegel Exercises, and 3) straining, were correlated with three forms of urinary dysfunction, 1) urinary tract infection, 2) occasional loss of urine, and 3) mild stress incontinence. A significance level was set of  $<.05$ . One detrimental voiding behavior, stopping voiding with Kegel Exercises was significant at the  $<.05$  level associated with the occurrence of mild stress incontinence. It is important to note that the four informants who were using Kegel Exercises started doing the exercises out of curiosity or to improve their sex life. When they started doing the exercises they were not having signs and symptoms of stress incontinence. Four or more years later they began to develop signs and symptoms of stress incontinence.

Scores for detrimental voiding behaviors provided no meaningful data in as much as frequency of using these behaviors was not measured. For example, informant number seven used four detrimental voiding behaviors, but has never had a urinary tract

infection. Informant number four only used two detrimental voiding behaviors and she has had twenty-five urinary tract infections. However, she voided only twice in twenty-four hours. It is not known what effect certain voiding behaviors have on the occurrence of urinary tract infections. However, the data did reveal that habitual postponing of urination and habitual stopping of urination was associated with a total of fifty-two urinary tract infections for the six informants in this study who habitually practiced these two voiding behaviors.

#### Summary

This chapter has presented the results of the study. The results include the informants' responses to the urination history interview, the 24 hour fluid intake and urinary output log, and the informants' responses to interviewing on her personal-social lifestyle as related to urination.

Informants who stated that they practiced postponing and stopping voiding behavior habitually in their daily lives had a higher incidence of urinary tract infections than the informants who only used postponing and stopping voiding behavior occasionally. Ninety percent of the informants have had at least one urinary tract infection. Finally, statistical analysis revealed that one voiding behavior, stopping voiding with Kegel Exercises, was positively correlated with the occurrence of mild stress incontinence.

As expected, the idea that women are unaware of how they accomplished urination was supported by all ten informants. Their answers ranged from "I don't know" to "I don't do anything, just sit." Finally, the study supports the fact that urinary tract infection is a common female problem. Nine of the ten informants have had at least one urinary tract infection, and one informant has had at least twenty-five urinary tract infections.

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

This chapter will discuss the conclusions drawn from the findings of research on female voiding behaviors, and suggest recommendations for additional study on the prevention of urinary tract infections.

#### Conclusions

Normal urination as described by the informants in this research was a voluntary emptying of their bladders. Urination was preceded by an "urge to urinate" which the informants described as a "full feeling" and a "pressure sensation in the lower abdomen." The urge to urinate could be inhibited and postponed for periods of from fifteen minutes to eight or ten hours. When the informants decided to empty their bladders, they initiated urination by "sitting and waiting," "pushing on their lower abdomen," or by "doing nothing." None of the informants were aware that they did anything to maintain their urinary stream. Bladder emptying by the informants in this study was accomplished by "waiting until the last drips stopped." Although

the informants were very aware of the absence of pressure or pain which a full bladder produced, the informants were unaware of any special sensation when their bladders were empty. Nor did they feel the last few drops of urine coming out. They just waited until they thought that no more urine was coming. Two informants listened to their urine.

Waiting for urine to drip out was frustrating for seven of the informants and consequently produced a voiding behavior which shortens the voiding process. Hurrying to finish voiding was routinely practiced by seven of the informants. The women described their frustration as "I can't sit there all day," "I just hope I'm done," and "I just shut it off."

In order to finish voiding in a hurry the women contracted pelvic muscles and prevented any additional urinary flow. The study was not designed to measure the amounts of urine which may still be in the bladder when a woman decided that voiding had taken enough of her time. However, it might be that women who consistently hurry to finish voiding will retain residual urine volumes and subsequently develop more urinary tract infections.

The one informant in this study who has never had a urinary tract infection described her urination as "a routine habit done at specific times during the day." "I go when I wake up, before and after meals, before leaving the house, at work if I have to, before going to bed, before I go out jogging, and after having sex." Her urination has never given her any problem. She has never done any

exercises to increase the tone of her pelvic muscles. She described her voiding process as follows. "I sit on the seat with both feet on the floor. My back is forward a little. When my stream slows down, I lean forward and push down with my abdominal muscles until there aren't any more drips coming out. Then I dry myself with tissue and get up."

Four areas in a woman's personal-social lifestyle were explored for their effects on female urination. The four areas were: 1) habits, 2) work, 3) recreation, and 4) relationships.

The habits category included type and amount of fluids consumed, smoking and the use of street drugs. As was expected, increased fluid intake resulted in increased urinary output, and alcohol and coffee stimulated the women to void more frequently. An unexpected finding was that alcohol consumption decreased a woman's ability to postpone urination very long. "When I'm out drinking, I can't hold my urine very long so I usually head for the bathroom as soon as I get the urge."

This finding was evident in women who drank both coffee and alcohol. Depending on the circumstances, the informants were able to consume two or three cups of coffee and still postpone the urge to void. When they were drinking alcohol, they were not able to postpone the urge to void for longer than thirty minutes.

Perhaps the most significant pattern of female voiding behavior which emerged during the study is how women change their voiding behavior because of their work environment. Women who usually

void shortly after feeling the urge to void and those women who usually wait for their bladder to empty, felt that they should not waste time at work either by taking too long to void or by frequent voidings. While at work, each women was acutely aware of the interrupting effect of urination and subsequently limited her fluid intake, postponed voiding, hurried to start and stop the voiding process, and used straining to initiate voiding. In addition, sharing bathroom facilities with other female employees also resulted in postponing urination.

Recreation had a different effect on female voiding behaviors. The informants didn't postpone urination, instead, they anticipated being interrupted by the urge to void and emptied their bladders before hand, or they didn't even think about it. "It's the last thing I think about." "I'm too busy having fun." "I burn up all my fluid." Two of the informants stated that "I'm aware of having the urge to void when I stop some kind of physical activity." "I go as soon as I get back home from bike riding."

Six of the sexually active informants described urination following intercourse as "part of routine cleanliness after intercourse." One informant attributed one of her urinary tract infections to intercourse and stated "but, that was because I wasn't sufficiently lubricated."

The study did reveal that detrimental voiding behaviors are used by women in general. The four behaviors which the informants in this study used were: 1) postponing urination, 2) hurrying to finish

urinating, 3) straining to start urination, and 4) stopping urination. The last detrimental voiding behavior, stopping urination, was regularly used by four informants. Although it is not possible to determine from this study what effect stopping voiding behavior has on the occurrence of urinary tract infection, the combination of stopping voiding and postponing urination if done on a regular basis did increase a woman's chances of having a urinary tract infection for these informants.

Four informants regularly used stopping voiding behavior as an exercise. The exercises were started because of curiosity and claims that "the exercises would make sex better." The informants were not experiencing episodes of lost urine when they sneezed, coughed or laughed prior to starting the exercises. Now, four to six years later, these same women are experiencing signs and symptoms of mild stress incontinence. Furthermore, they believe that "the symptoms are part of getting older, and I should do the exercises even more often."

#### Clinical Implications

Recommendations from this research on female voiding behaviors are as follows. Community health nurses can 1) help female clients to increase each woman's awareness of her urination, 2) encourage women to void when they have the urge, 3) encourage women to completely empty their bladders at the end of each voiding, and 4) help other health care providers who care for female patients.

### Specific Areas of Concern for Study

Specific areas of concern for study are toilet training practices of females in American culture and the effects of stopping voiding exercises on female urinary continence.

#### Toilet Training Females

One informant in this study spoke of being "able to control my urine real good." This informant only voided twice in a twenty-four period, and she has had twenty-five urinary tract infections starting when she was four years old. Another informant stated that urination should be a quick process. "It shouldn't interfere with what you're doing. I'm a quick pee-er, I just shut it off and hope that I'm done."

#### Stopping Voiding Exercises

Improving muscle tone thorough exercise cannot be negated, however, interrupting a physiological process such as urination requires more research before the information is taught to the female community members.

#### Recommendations for Further Study

The following recommendations are suggested based on the findings in this study.

1. Replicate the study with a larger sample.
2. Redesign the study based on the findings of the present study.

3. Conduct a longitudinal study investigating the relationship of continued Kegel Exercises to the development of signs and symptoms of stress incontinence.

#### Summary

To utilize the results of this exploratory study, community health nurses can help each female client by increasing her awareness of her own urination. Urination normally occurs six to ten times a day. Females should learn to anticipate urination and possibly the lack of available bathroom facilities by emptying their bladders before leaving home or participating in physical activities.

Detrimental voiding behaviors such as postponing voiding, hurrying to finish urination, straining to initiate urination and stopping urination should be addressed with each client. Finally, for sexually active females, urination after intercourse is an effective means of cleansing the urethra of potentially infectious bacteria (Stewart, 1979).

Additional research is indicated on the benefits or risks of pelvic floor exercises. It is possible that people in the health care fields have misinterpreted Dr. Kegel's suggestions. As stated earlier, exercise does improve muscle tone, but the interruption of a physiological process may have detrimental effects.

## APPENDIX A

### DISCLAIMER

Jean Hardy has explained that she is conducting a study of female urination. The purpose of the study is to learn how normal women urinate. She will interview me on three separate occasions: 1) after I have read this disclaimer, 2) after I complete a 24 hour fluid intake and urinary output log, and 3) one month after the second interview. During each interview I will be asked open-ended questions on three phases of the urination process: 1) initiating urination, 2) maintaining the flow of urine, and 3) emptying my bladder of urine.

The demands expected of me include the interviews and the 24 hour log. There are no known risks associated with the study. The benefits of the study are that knowledge pertaining to normal female urination may enable health care providers to develop teaching methods for preventing the occurrence of recurrent urinary tract infections.

I understand that our conversations will be taped, but that no names will be attached to the data. I also understand that my questions will be answered, and that I am free to withdraw from the project at any time without incurring ill will.

## APENDIX B

### INTERVIEW GUIDE

#### Present History:

Location -- Tell me how you urinate?  
What is your urine like?

Quantity -- How much do you urinate?

Chronology -- How do you urinate in the morning?  
Is it different in the evening?

Cognitive -- How do you get your urine started?

Onset -- When do you urinate?

Modifiers -- Does anything make urinating easier?  
More difficult? Do you lose urine?  
Tell me about it.

Associated Symptoms -- What other sensations are you aware  
of when you have to urinate? During urination?  
At the end of urination?

Frequency -- How often do you urinate? What activities are  
associated with urination that is more frequent?  
Less frequent? How do you clean yourself  
afterwards?

#### Past History:

Have you ever had a problem urinating? Any pain?  
Infection? Getting your urine started?

**Family History:**

Has anyone in your family had a urinary problem?  
Tell me about it.

**Personal-Social:**

This section will include questions on habits, work,  
recreation and relationships as they pertain to urination.

For example, do you drink alcohol? Does it change your  
urinating? Do you go camping? How do you urinate then?

APPENDIX C

24 HOUR LOG

Each subject will be supplied with a urine container marked in cc.

Time	Intake	Output	Color	Odor	Place	Activity	Subjective -- Changes
6am	200 cc						
6:20 am		350 cc	Yellow	0	Home	Just awake	Usual 1st time urinating for today

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