

Applying the Theory of Planned Behavior to Understand Milk Consumption among WIC Pregnant Women

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ABSTRACT

Despite the importance of prenatal nutrition, many studies find inadequate calcium intake among pregnant women. The purpose of this study was to investigate the value of the Theory of Planned Behavior in explaining the intentions and the actual consumption of milk among pregnant women participating in or eligible for WIC. A cross-sectional survey was conducted to collect information regarding attitudes, subjective norms, perceived control, milk allocation within the family, intentions and consumption of milk. The survey questionnaire was developed using open-ended questions and interviews with 112 pregnant women. One-hundred-eighty women recruited from prenatal clinics completed the survey questionnaire. Multiple regression was used separately to investigate the association of factors to intentions and to the consumption of milk, as proposed in the theory. Milk allocation within the family was used as an exploratory variable to explain milk consumption. Study findings revealed that all three factors, attitudes, subjective norms and perceived control contributed to the model in explaining intentions (explained variance : 36.2%), with perceived control being most important. For milk consumption, intentions and perceived control were related significantly to actual consumption, while milk allocation within the family was not (explained variance : 44.6%). These findings suggest that perceived control is important in understanding both intentions and milk consumption, providing empirical evidence for the Theory of Planned Behavior. With respect to the role of perceived control, more strong evidence was provided in explaining intentions. Findings suggest that educational interventions to increase milk consumption among pregnant women should incorporate strategies to enhance the perception of control, and to strengthen positive attitudes and to elicit social support from significant others. (*Korean J Community Nutrition* 1(2) : 239~249, 1996)

KEY WORDS : theory of planned behavior · pregnant women · attitudes · subjective norms · perceived control · milk consumption.

Introduction

Maternal nutrition is an important, modifiable factor that influences pregnancy outcome. Along with scientific research, there has been practical effort to improve the nutritional status of pregnant women in the U.S. An outstanding example is the Special Supplemental Food Program for Women, Infants, and Children(WIC). Pregnant women are eligible for

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WIC if they are from low-income families and at nutritional risk. Pregnant women enrolled in WIC receive supplemental foods and nutrition education (Rush et al., 1988). Dietary intake surveys of pregnant women, however, suggest that simple provision of supplemental foods is not sufficient in promoting desirable nutrition behavior (Endres et al., 1985; Endres et al., 1987). Endres et al. (1985) also point out that supplemental foods may be shared with family members although these are designed to supplement the diets of pregnant women.

Nutrition education can be an effective way of achieving dietary changes. However, recent review of prenatal nutrition education revealed that most of educational programs lack educational diagnosis (e.g., needs assessment) or theoretical frameworks in developing interventions (Boyd, Windsor 1993; Contento et al., 1995). The authors suggest that future research conduct an educational diagnosis for the target population using a theoretical approach. Theory-based research has advantages for explaining and predicting behaviors (Ryn, Heaney 1992). This is especially true for understanding the comprehensive nature of nutrition behavior. The theory guides us to conduct robust research by suggesting: 1) which variables (factors) we might examine, 2) how these variables are related to a certain type of nutrition behavior.

Multiple factors influence the nutrition behavior of pregnant women. Beliefs and attitudes are important in determining the nutrition behavior of pregnant women (Anderson, Shepherd 1989; Gulick et al., 1986). Social influence (environmental influence) also seemed to be significant, considering that pregnancy is viewed as a time of getting more attention (Baric, Macarthur 1977; Mitchell, Lerner 1991). Recently, the concept of perceived control, similar to self-efficacy, has received attention as a determinant of nutrition behavior in the general population (Sheeshka et al., 1993; Raats et al., 1993; Strecher et al., 1986).

Considering the fact that nutrition behavior is complex and various factors influence it, comprehensiveness is crucial when choosing a theoretical framework to understand nutrition behavior. The Theory of Planned Behavior (TPB), derived from the TRA, provides a useful framework for this purpose (Fishbein, Ajzen

1975; Ajzen, Madden, 1986).

This theory describes the relationship of behavioral determinants to intention and behavior in two ways (Ajzen, Madden 1986; Ajzen, 1987). The first model proposes intention as a major factor that influences behavior, as in the TRA. In other words, if one has the intention to behave in a certain way he or she does it. More specifically, this model proposes that person's intentions are determined by three conceptually distinct factors. These include personal attitudes toward the behavior (a personal factor), subjective norms reflecting the influence of social environment (a social factor), and a perceived behavioral control (a feasibility factor). Perceived behavioral control, which is newly added to the constructs in the TRA, is defined as the perceived ease or difficulty regarding the performance of a behavior (Ajzen, Madden, 1986). The value of this theory is that it helps us to understand the causes of behavior by investigating salient information, which are the beliefs underlying the three factors determining intentions. Person's attitudes are formed through salient beliefs regarding the consequences of a behavior (behavioral beliefs) and the evaluation of those consequences (values). Subjective norms are influenced by normative beliefs that significant individuals in one's environment think that one should or should not perform the behavior (normative beliefs), and a person's motivation to conform to them. Perceived behavioral control is based on the beliefs regarding resources and opportunities (i.e., control beliefs) for the performance of a behavior (Ajzen, Madden, 1986; Ajzen, 1987).

The second model suggests that intentions are not sufficient in explaining behavior. Even though one is willing to do something, he or she will not carry out an action if one does not feel control over circumstances or does not have the ability to do. Therefore, perceived behavioral control has a direct influence on a behavior in the second model.

The TPB has been used and tested in the past several years to explain health behaviors (Beale, Manstead 1991; DeVellis et al., 1990; Godin et al., 1992; Godin et al., 1993; Raats et al., 1993; Schifter, Ajzen 1985). Many studies applying the TPB supported the idea that incorporating perceived control is

useful in understanding the intentions and actual performance of behavior. However, there were only a few studies that examined the utility of this theory to understand nutrition behavior (Beale, Manstead 1991 ; Raats et al., 1993). More research is needed to clarify the relationship of constructs suggested in the TPB, especially regarding nutrition behavior. In addition, the perception of control has not been investigated in nutritional research of pregnant women, although it has implications for intentions and actual performance of behavior.

The purpose of this study is to test the value of the Theory of Planned Behavior (TPB) in explaining nutrition behavior of pregnant women. For examining nutrition behavior, we chose 'milk consumption' (specific behavior) instead of 'intakes of specific nutrients' (e.g., dietary calcium : less specific). This is based on the recommendation that variables be measured more specifically if intentions and behavior are to be understood and predicted more accurately (Ajzen, Fishbein 1977).

Milk consumption was chosen because it is a rich source of calcium which should be sufficient but deficient in the diets of pregnant women in the U.S. (Edozien et al., 1979 ; Endres et al., 1981 ; Endres et al., 1985 ; Endres et al., 1987). Also, milk is a major contributor of dietary calcium, representing a large percentage of calcium intake (up to 60%) for several populations studied (Barr, 1994 ; Block et al., 1985 ; Borrud et al., 1993). In addition, WIC provides plenty of

milk (amounts equivalent to 3.5 cups of milk per day) (Rush et al., 1988) and findings of this study consequently have implications for nutrition education in WIC.

The proposed relation of variables in this study following the TPB is presented in Fig. 1. Milk allocation within the family was included as an exploratory variable to investigate if the degree of sharing food (i.e., milk) within a family influences the level of milk consumption in pregnant women.

Subjects and Methods

1. Study design and subjects

There were two stages in this study : a pilot study and main survey. Series of pilot studies were conducted to elicit the information necessary for developing a main survey instrument. The main study used a cross-sectional survey design.

Subjects were drawn from two prenatal clinics at county health departments in South Carolina, U.S.A. Those who participated in pilot studies were not asked to join for the main survey. Subjects were also limited to low-risk women who did not have medical problems. The investigator contacted 231 pregnant women for the main survey : fifty-one women either refused participation or provided incomplete information. Finally, the sample was composed of 180 pregnant women (response rate of 78%).

2. Measurement

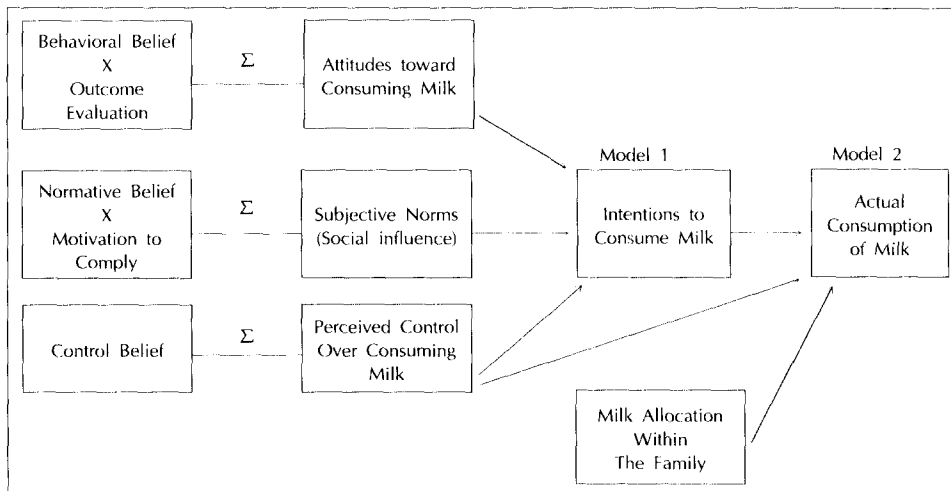


Fig. 1. Proposed relation of variables.

The survey instrument was developed according to the steps suggested by Ajzen, Fishbein(1980) and Ajzen, Madden(1986). The development of survey instrument is described below.

Attitudes toward milk consumption : Ninety-two WIC women responded to open-ended questions to elicit advantages or disadvantages of consuming milk. After reviewing responses and several revisions, fifteen items were constructed to measure behavioral beliefs. Examples of these items are beliefs regarding nutritional benefits, practical reasons(e.g., taste, quenching thirst, going well with other foods, etc.) and side effects of consuming milk(e.g., upset stomach, constipation). Each item was written using 5-point scales ranging from 'very unlikely' to 'very likely' to indicate the strength of these beliefs. Corresponding evaluations of each outcome(value) were measured using 5-point Likert scales with endpoints of 'very bad' to 'very good'. Attitudes toward milk consumption were defined as the sum of specific behavioral belief multiplied by the corresponding value. The Chronbach's alpha of reliability for these combined items was 0.76.

Subjective norms : Seventeen different significant others were identified by these same women(n=92) and categorized into six groups : mother/parents, husband/boyfriend, sister/brother/other relatives, doctor, friends/best friend, and nurse/WIC staff/nutritionist. Based on this information, items for normative beliefs were constructed and rated on 5-point scales with endpoints of 'very unlikely' to 'very likely'. The corresponding motivation to comply with each significant other(referent) was measured on 5-point scales ranging from 'not at all' to 'very much'. Subjective norms were defined as the summated score of each normative belief-motivation to comply product. The reliability of this scale was 0.79.

Perceived control over consuming milk : The items for control beliefs were chosen based on responses on an open-ended questionnaire to elicit facilitating or preventing factors related to milk consumption(n=20 women), and items used in other studies(Ajzen, Madden 1986 : Beale, Manstead 1991). In a final questionnaire, 12 items were used to represent control beliefs, and labeled on 5-point scales ranging from 'very difficult' to 'very easy' or 'strongly disagree' to

'strongly agree'. Examples of these beliefs are : perceived confidence in substituting milk for other beverages, cooking skills, keeping milk fresh, keeping milk available at home, etc. Perceived control over consuming milk was defined as the sum of control beliefs. The Chronbach's alpha for this scale was 0.77.

Milk allocation within the family : This variable was devised to indicate the degree of sharing milk within a family. Three items were used to indicate other family members' drinking of milk at home at different meal times, and labeled on 5-point scales of 'none' to 'very much'. The summated score was used to measure milk allocation within the family.

Intentions to consume milk : Intentions were measured by two items. The first item, "How likely is that you will drink at least two cups of milk a day (including milk from milk containing foods) for the next month?", was measured on 5 point-scales of 'very unlikely' to 'very likely'. The second item, "How often do you plan to drink/eat milk for the next month?" was rated on 5-point scales ranging from 'never/rare' to '4 servings/day'. Responses on these items were summed into a single intention variable.

Milk consumption : Food items regarding milk in 'Health Habits and History Questionnaire : Diet History and Other Risk Factors' were used to assess milk consumption(National Cancer Institute, 1988). In addition to the consumption of fluid milk, milk used in cooking or added in cereal were included to measure milk consumption more correctly. Using the NCI instrument, subjects were asked to indicate the frequency of consumption of specific food items and usual portion size. Based on this, milk consumption was quantified as the number of servings(cups) per day.

3. Data Collection

Data collection took place in the waiting rooms of prenatal clinics. Before filling out the questionnaire, subjects were clearly informed that the important thing was honest responses and their own opinions regarding milk consumption in order to reduce the bias from social desirability. The survey was self-administered except the section for measuring milk consumption. The investigator interviewed pregnant women using a food model of a standard portion size to

measure milk consumption. It took about 15 to 20 minutes for most of the women to finish answering.

4. Statistical Analysis

Data were analyzed using the Statistical Analysis System. Descriptive statistics were used to examine the distribution of demographics and study variables. Crude relationship among study variables and demographics was examined using correlation analysis or one way analysis of variance.

To investigate the association of factors to intentions and consumption of milk, regression approaches were used ; one for predicting intentions and the other for predicting milk consumption. Based on preliminary analyses, demographic variables considered as confounders were controlled for the regression model. To examine the relative importance of each variable in explaining variance in the dependent variable, square of the standardized beta for each variable was obtained and the ratio of the square of each standardized beta was examined(Kachigan, 1986). A level of $p < 0.05$ was used as statistically significant for these tests.

Results and Discussion

1. Descriptive statistics

The demographic characteristics of subjects are shown in Table 1. The majority of subjects were adults(63.3%) ; unmarried(70%) ; received high school or below high school education(80.7%) ; enrolled in WIC(68.3%) or requested certification for WIC(21.0%) ; in their second or third trimester(79.1%). About half had prior experience with WIC.

As presented in Table 2, subjects indicated a willingness to consume milk. The mean of summated intention items was 2.07 ± 1.47 , from a possible score of - 4 to +4. The subject's strong intentions to consume milk were consistent with the finding of Anderson and Shepherd's study(1989) that pregnant women are willing to make dietary changes as recommended. It is also possible that positive intentions result from subject's perception that they answered in a socially acceptable way, although the importance of their own responses was stressed before filling out the

Table 1. Demographic characteristics of subjects

Variable	Frequency (n=180)	Percent
<u>Age</u>		
13 - 19 years	66	36.7
Over 19 years	114	63.3
<u>Race</u>		
African American & others	87	48.3
White	93	51.7
<u>Educational Level</u>		
Less or equal to 12th grade	142	80.7
More than 12th grade	34	19.3
<u>Marital status</u>		
Single, other	126	70.0
Married	54	30.0
<u>Gravida</u>		
Primigravida	85	47.5
Multigravida	94	52.5
<u>Trimester</u>		
First	37	20.9
Second	72	40.7
Third	68	38.4
<u>WIC enrollment</u>		
Currently enrolled	123	68.3
Apply for WIC or no	57	31.7
<u>Previous WIC experience</u>		
No	89	49.7
Yes	90	50.3

() : number with missing data

Table 2. Distribution of intentions to consume milk

Intention score ^a	Frequency	Percent
- 2	2	1.1
- 1	9	5.0
0	19	10.6
+1	22	12.2
+2	56	31.1
+3	37	20.6
+4	35	19.4

a. summated score on two items ; Responses for each item were given a score ranging from - 2 to +2. A higher score indicates more positive intentions to consume milk.

questionnaire.

Table 3 shows the distribution of milk consumption. The mean of milk consumption was 1.80 ± 1.22 cups

per day, with a range of zero to five cups per day. The average milk consumption was higher than that reported in Endres et al.'s survey (1987) of pregnant women who were receiving WIC benefits. However, the finding that about 31% of women drank less than a cup of milk or none at all presents concern regarding calcium intake. Although other dairy foods are good sources of dietary calcium, research suggests that those who do not drink adequate amounts of milk are less likely to eat other dairy foods and subsequently to have inadequate intakes of dietary calcium (Barr, 1994; Borrud et al., 1993).

The crude relationship among study variables were examined using Pearson correlation coefficients (Table 4). Milk consumption was highly correlated with intentions to drink milk ($r=0.64$, $p=0.0001$), and perceived control over consuming milk ($r=0.49$, $p=0.0001$). The degree of correlation between actual consumption and intentions was lower than that reported in studies applying the TRA (Ajzen, Fishbein 1980; Manstead et al., 1983). This suggests that milk consumption behavior is not just explained by intentions

to do so. Intentions to drink milk were significantly related to the proposed independent variables in the following order of decreasing correlation: perceived control, attitudes toward milk consumption and subjective norms.

Among the continuous demographic variables, age was slightly related to milk consumption: Older women drank less milk ($r=-0.16$; Table 4). Results of one way analysis of variance revealed that race was the only categorical demographic variable associated with milk consumption. White pregnant women drank more milk than African American and other minority women on average (Mean \pm SD: 2.0 ± 1.3 cups/day for White, 1.6 ± 1.1 for African American and others, $p=0.012$).

2. Regression for intentions to consume milk

The multiple regression model was significant in predicting intentions to consume milk (Table 5). The three independent variables as a set explained 36.2% of the variance in intentions. This result provides strong empirical evidence for the TPB. The variance in intentions explained by independent variables was slightly above those reported in the other studies examining nutrition behavior (Anderson, Shepherd 1989; Brug et al., 1994).

Based on partial-F values, perceived control over consuming milk was a strong predictor of intentions, followed by attitudes and subjective norms. The relative importance of these variables was examined by

Table 3. Distribution of milk consumption

Milk consumption(cups/day)	Frequency	Percent
0 \leq milk drinking < 1	55	30.6
1 \leq milk drinking < 2	43	23.9
2 \leq milk drinking < 3	41	22.8
3 \leq milk drinking < 4	28	15.6
4 \leq milk drinking \leq 5	13	7.2

Table 4. Correlation among variables^a

Variable	Milk consumption	Intentions	Attitudes	Subjective norms	Perceived control	Age	Grade	Gravida	Live births	Prenatal visits
Milk consumption	1.00									
Intentions	0.64***	1.00								
Attitudes	0.48***	0.47***	1.00							
Subjective norms	0.28***	0.40***	0.48***	1.00						
Perceived control	0.49***	0.50***	0.37***	0.25***	1.00					
Age	-0.16*	-0.06	-0.07	-0.13	-0.28***	1.00				
Grade	-0.04	0.05	0.05	0.00	-0.03	0.47***	1.00			
Gravida	-0.08	-0.07	0.06	0.15*	-0.26***	0.49***	0.05	1.00		
Number of live births	-0.11	-0.07	0.00	-0.12	-0.23***	0.51***	0.12	0.87***	1.00	
Number of prenatal visits	0.15	-0.07	0.06	-0.10	0.17*	-0.09	-0.08	-0.23**	-0.19*	1.00

a. based on Pearson correlation coefficient * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 5. Multiple regression of intentions to consume milk on attitudes, subjective norms, perceived control

Variable	b ^a	Standard error	β^b	F	p value	model R ² c
Attitudes	0.031	0.009	0.236	11.03	0.0011	0.362
Subjective norms	0.032	0.011	0.202	8.77	0.0035	
Perceived control	0.089	0.016	0.362	31.51	0.0001	

model F = 34.84, p = 0.0001, DF = 3, 176.

^aunstandardized parameter estimate

^bstandardized parameter estimate

^cadjusted R²

the ratio of square of the standardized beta for each variable (Kachigan, 1986). According to this calculation, perceived control accounted for 2.4 times more variation in intentions than attitudes did ($0.362^2/0.236^2$), and 3.2 times more variation in intentions than subjective norms did ($0.362^2/0.202^2$). Attitudes toward milk consumption were slightly more important than subjective norms in terms of explaining variation in intentions to consume milk (1.4 times).

Study results suggest that pregnant women are more likely to consume milk if they believe more strongly that they have control over consuming milk. The importance of perceived control has been noted in literature, as in explaining the intention to adopt healthy eating practices in adults (Sheeshka et al., 1993) or in other health behaviors such as exercise (Godin et al., 1989; Godin et al., 1991). At initial developmental stages of the TPB, the major concern was to find if perceived control explained additional variance beyond that explained by attitudes and subjective norms (Ajzen, Madden 1986; Beale, Manstead 1991; DeVellis et al., 1990). These studies revealed that perceived control played a significant role in predicting intentions for several different behaviors, although relative importance of predictor variables could not be determined in these studies. The current study confirmed the previous findings that perceived control contribute to the prediction of intentions. Furthermore, it is remarkable that perceived control is a more important consideration than attitudes or subjective norms in deciding pregnant women's intentions to consume milk.

Attitudes and subjective norms, also contributed to the model predicting intentions, with attitudes being just slightly more important than subjective norms. In many studies applying the traditional Theory of Reasoned Action (TRA) or Planned Behavior (TPB), attitudes were generally more important than subjective

norms (Anderson, Shepherd 1989; DeVellis et al., 1990; Saunders, Rahilly 1990). The difference in findings might be attributed to the characteristics of study population. Subjects of the previous studies (Anderson, Shepherd 1989; Godin et al., 1989) were women from the middle-class and highly educated, while the current study subjects mainly consisted of a low-income group with less education. It may be that more educated women find it easier to base their decision on their own beliefs rather than the opinion or influence of others.

3. Regression for milk consumption

The multiple regression model explained 44.6% of the variation in milk consumption (Table 6). As proposed in the TPB, intentions and perceived control over consuming milk had a significant association with actual milk consumption. However, milk allocation within the family did not.

The preliminary analyses showed that age and race was related to milk consumption, therefore, another regression was run while controlling the effect of these variables (Table 6). The variance explained by predictor variables in this model was almost the same as in the previous model (partial R² = 0.440). The relative importance of perceived control on milk consumption, however, was decreased when controlled for age and race. Based on the ratio of square of the standardized regression coefficients, intentions were six times more important than perceived control in predicting milk consumption ($0.538^2/0.219^2$), but this ratio was increased to 11.0 controlling the effect of age and race.

Study findings suggest that milk consumption is mainly explained by intentions, which mediate the influence of attitudes, subjective norms, and perceived control. At the same time, study findings support the notion that milk consumption, as in most other behaviors, is not influenced by intentions alone. It might

Table 6. Multiple regression of milk consumption on the independent variables

Variable	b ^a	Standard error	β^b	F	p value	R ^{2c}
A. Without control for demographics ^d						
Intention	0.445	0.054	0.538	69.01	0.0001	0.446
Perceived control	0.045	0.013	0.219	11.44	0.0009	
Milk allocation within the family	0.079	0.080	0.056	0.99	0.3214	
B. Control for age, race ^e						
Age	-0.018	0.016	-0.067	1.34	0.2491	
Race	0.293	0.139	0.121	4.44	0.0366	
Intention	0.460	0.053	0.556	74.09	0.0001	0.457
Perceived control	0.033	0.014	0.163	5.58	0.0192	
Milk allocation within the family	0.057	0.079	0.040	0.52	0.4721	

^aunstandardized parameter estimate. ^bstandardized parameter estimate. ^cadjusted R²

^dmodel F=48.96, p=0.0001, DF=3, 176 ^emodel F=31.07, p=0.0001, DF=5, 174

be true, especially for behaviors such as nutrition behavior, which is complex and deeply rooted in lifestyle and culture. The perception of control is necessary as well as the motivation to perform a behavior.

The current study findings revealed that perceived control is important in models for predicting intentions and for predicting milk consumption. However, perceived control contributed more to the model for intentions, compared to the model for actual milk consumption (Table 5, 6).

The present study showed that milk allocation within the family had no relation with milk consumption in pregnant women. This variable was used as an exploratory one to investigate if sharing foods within a household influences nutrition behavior. Also, this variable was used to reflect the notion that supplemental foods from WIC might be shared with other family members although these foods were given just to pregnant women to supplement their diets (Endres et al., 1985). This idea was not supported in the current study. This insignificant finding might be attributed to the inability to measure the milk allocation variable within the family as intended.

4. Implications for nutrition education research and practice

Study results clearly reveal that TPB is useful in explaining milk consumption among pregnant women. The subjects for this study, however, were women mainly enrolled in or eligible for WIC in South Carolina, U.S.A., therefore, study findings might not be generalizable to other groups of pregnant women.

Also, the causal association could not be established in this study due to the cross-sectional nature of the study. Taking these limitations into consideration, the implications from this study might be made cautiously for future research and practice.

This study indicates the importance of perceived control on the decisions to consume and the actual consumption of milk, and confirmed the findings of Ajzen, Madden (1986). As this study shows the importance of perceived control, it is necessary to have a deeper understanding of what perceived control means or explains. More future research is needed to refine the perceived control variable conceptually and operationally. In addition, future research may attempt to investigate which factors influence the perception of control over consuming milk. The results of this study also provide the basis for the design of interventions to determine if causal relationships exist between TPB constructs and milk consumption.

Study findings also have implications for practitioners. Most of all, practitioners should focus on the three factors examined in this study in designing educational programs: to increase the perception of control over consuming milk, to strengthen favorable attitudes by emphasizing positive beliefs and minimizing negative beliefs, and to help pregnant women have more support from significant others. These strategies will hopefully lead to changes in intentions and accordingly help pregnant women to increase milk consumption. This study indicates that the traditional approach of providing information about nutrition is not enough to help pregnant women to consume ade-

quate amounts of milk. In developing strategies to increase the perceived confidence over consuming milk, practitioners may refer to Bandura's suggestion(1977). This includes personal and successful experience, vicarious observation, verbal persuasion and reinforcement, and methods to deal with emotional arousal. In addition, educational programs for enhancing milk consumption in this study population should consider diverse approach including targeting significant others.

Summary and Conclusion

This study examined motivational factors to understand intentions and consumption of milk among pregnant women. The motivational factors were investigated within the framework of the TPB : attitudes, subjective norms, perceived control. The milk allocation within the family was used as an exploratory variable for explaining milk consumption.

Study findings revealed that all three factors, attitudes, subjective norms, and perceived control contributed to the model for explaining intentions, with perceived control being most important. Intentions were strong correlates of actual milk consumption, and perceived control was independently related to milk consumption. These findings provide the empirical evidence for the TPB in explaining nutrition behavior. With respect to the role of perceived control, more strong evidence was provided for explaining intentions.

This study suggests that educational interventions may first emphasize increasing the perception of control over consuming milk, in an attempt to help pregnant women be motivated to consume milk. In addition, interventions may include strategies to change attitudes toward milk consumption by helping pregnant women realize positive beliefs and modifying negative beliefs, and to elicit social support from significant others.

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= 국 문 초 록 =

저소득층 임신부들의 우유 소비 행동을 이해하기 위한 예측이론 (Theory of Planned Behavior)의 적용

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임신기 영양의 중요성이 널리 알려져 있지만, 여러 연구 결과를 보면 미국내 저소득층 임신부들에게서식이 칼슘의 섭취가 부족한 것으로 나타나고 있다. 본 연구에서는 WIC 프로그램에 참여 자격이 있거나 가입한 임신부를 대상으로 이들의 우유 소비 의향과 실제 소비에 영향을 주는 요인을 알아보고자 하였고, 이를 위해 사회과학에서 유래된 행동 설명 이론인 Theory of Planned Behavior 를 적용하여 이 이론이 영양행동을 설명하는데 유용한지 조사하였다. 횡단적 survey를 이용하여, 우유 소비 의향과 실제 소비, 그리고 요인으로 우유 소비와 관련된 개인의 태도, 주위인과 사회적 영향, 우유 소비와 관계된 통제력(자신감), 가정내의 우유 배분을 조사하였다. 설문지는 112명의 임신부를 대상으로 개방형 질문과 인터뷰를 통해 작성하였고, 본 설문 조사에는 보건소내 산전 관리 클리닉을 방문한 180명의 임신부가 참여하였다. 자료는 주로 중회귀분석을 이용하여 분석하였고, 이론에 제시된 바와 같이 우유 소비 의향과 실제 소비에 대한 두가지 다른 모델을 테스트하였다. 가정내의 우유 배분 정도는 이 이론내의 construct는 아니지만 우유 소비를 설명하기 위해 조사하였다.

연구 결과, 이론내 세 변수, 즉 개인의 태도, 주위인과 사회적 환경, 통제력 모두 소비 의향과 관련이 있었으며(소비 의향의 36.2% 변동 설명) 이 중 통제력이 소비 의향을 나타내는데 가장 중요했다. 또한 이론에서 제시하는 바와 같이 소비 의향과 통제력은 실제 소비와 유의적으로 관련이 있었으나, 가정내의 우유 배분은 임신부의 우유 소비와 상관이 없었다(실제 소비의 44.6% 변동 설명). 본 연구 결과, 우유 소비 행동에 대해 본인이 느끼고 있는 통제력내지 자신감이 소비 의향과 실제 소비를 설명하는데 매우 중요한 것으로 나타났으며, 이러한 결과로 볼 때 영양행동을 설명하는데 Theory of Planned Behavior가 유용하다고 할 수 있다. 우유 소비에 대한 통제력은 실제 소비보다는 의향을 설명하는데 그 역할이 더 컸다. 임신부의 우유 소비를 증가시키기 위한 interventions에서는 행동에 대한 통제력의 증가(즉 자신감의 증진), 신념의 변화로 인한 우유 소비에 대한 개인의 태도 변화, 임신부의 행동에 영향을 줄 수 있는 주위인들에게서 식행동이 변화될 수 있게 도움을 구하는 방법등 다양한 전략을 세우도록 해야 할 것이다.

중심 단어 : Theory of Planned Behavior · 임신부 · 태도 · 사회적 영향 · 통제력 · 우유 소비.