PERINATAL NUTRITION MISCONCEPTIONS AMONG PREGNANT ADOLESCENTS IN NORTHEASTERN OKLAHOMA

By

JANET CHUN-YEE PAN WANG

Bachelor of Science
University of Maryland
College Park, Maryland
1978

Bachelor of Science
Chun-Yuan Christian
University
Chun-Li, Taiwan
1974

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
MASTER OF SCIENCE
May, 1984

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NORTHEASTERN OKLAHOMA

Thesis Approved:

Bernice Koxell

Thesis Adviser

Marguerite Scruggs

Sue Knight

Norman N Durham

Dean of the Graduate College

ACKNOWLEDGMENTS

The author would like to express appreciation to Dr. Bernice Kopel for her guidance and direction in this research. Her patience and understanding has helped more than words can express.

I sincerely thank Dr. Margaret Scruggs for her special expertise and for serving as a committee member. Also, thanks to Dr. S. Knight for her time in evaluating this project and serving as a committee member.

Acknowledgments also given to Dr. William Warde for the development of the statistical program for this study and to Ms. Mai Chan in assisting computer programming.

Special thanks to Mrs. Nikita Brite, R.D., Claremore Indian Hospital, Mrs. Nancy Pate, Margaret Hudson Program, and Mrs. Pat McLaury, R.N., Washington County Health Unit to cooperate and assist in obtaining data for this study.

My greatest thanks is to my husband, Wayne, who has encouraged me through the many ups and downs and because of him it was easier.

This research project is dedicated to my parents, Mr. and Mrs. Hsi-Ching Pan; without their support the research would not have been possible.

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CHAPTER I

INTRODUCTION

The statistics verifying adolescent pregnancy as a major health problem in the United States have been well documented. Each year, over one million conceptions occur among girls under 20 years of age. Of great concern is the 61 percent increase in the total number of births to girls aged 15 and younger between 1960-1977 (1). In Oklahoma alone, there are over 150,000 teenagers who are sexually active, and the number of births to these ranks 9th in the nation. The estimated births to the Oklahoma girls, aged 14 or under, are increasing at a rate of 31 percent as compared to the nationwide average of 6.6 percent (2).

The increasing number of pregnancies among the younger teenage population has led to rising concerns regarding many social, physical, and psychological stresses which critically affect the outcome of pregnancy. Teenage girls are more prone to manifest the consequences of nutritional deficiencies than older women because they are experiencing a surge in sexual, physical, and psychological developments. Therefore, an adolescent girl who has not reached her full stature and becomes pregnant within four years after menarche is considered to be at the greatest risk in terms of her and her baby's biological development (3).

According to the American Academy of Pediatrics Committee Report

on teenage pregnancy, the major risks of pregnant teenagers were pre-eclampsia and low birth weight infants (4). Previous nutritional status surveys also cited that the teenage girls normally consumed the least adequate diets of all population groups (5,6). Additional studies showed that the suboptimal food intake was very common to the pregnant adolescent (7,8). All these findings suggest that nutritionally adequate diets are generally misunderstood or neglected by these girls as a group.

Wodarski (9) reported that due to the prevalence of misconceptions about foods and nutrition, the adolescent age group performed expectedly low on tests of nutritional knowledge. Such prevailing misconceptions lead to serious nutritional deficiencies and impose threat, particularly for the pregnant adolescents, to the health conditions for both teenage mother and her unborn child during the childbearing years. An intensive review of the literature revealed no studies on the perinatal nutrition misconceptions among pregnant adolescents. It is the researcher's belief, therefore, that a study of perinatal nutrition misconceptions held by pregnant adolescents in the northeastern part of Oklahoma would be of value to the health professionals in assisting pregnant adolescents in meeting their daily nutrient needs.

Purpose and Objectives

The purpose of this study was to determine perinatal nutrition misconceptions of pregnant adolescents aged 18 or under in the northeastern part of Oklahoma.

Specific objectives of this study were:

1. To identify background information, such as, race, place of residency, enrollment in Home Economics classes, sources of nutrition information, medical problems during pregnancy, and month of initial prenatal care.
2. To identify perinatal nutrition misconceptions of pregnant adolescents in Oklahoma.
3. To determine any association between the mean misconception scores of the respondents and each of the following: number of pregnancies, trimester of pregnancy, age, and mother's educational level.
4. To make suggestions and recommendations for nutrition education programs to assist pregnant adolescents to meet their nutritional needs.

Hypotheses

For this study, the following null hypotheses were postulated:

H_1: There will be no association between the mean misconception scores of the respondents and the number of pregnancies.

H_2: There will be no association between the mean misconception scores of the respondents and the trimester of pregnancy.

H_3: There will be no association between the mean misconception scores of the respondents and age of respondents.

H_4: There will be no association between the mean misconception scores and education levels of mothers of the respondents.

Assumptions

This study was planned on the following underlying assumptions.

1. The perinatal nutrition knowledge test is a valid instrument for

assessing the nutrition misconceptions of pregnant adolescents.

2. All responses are answered voluntarily and truthfully by the respondents.
3. The data will be useful in developing nutrition education programs to assist pregnant adolescents to meet their nutrient needs during pregnancy.

Limitations

1. The data were limited to the pregnant adolescents in Oklahoma who were enrolled in the Margaret Hudson program in Tulsa, Claremore Indian Hospital, Claremore; and Washington County Health unit, Bartlesville; between June and September, 1983, hence the result of this study cannot be extrapolated to the entire population.
2. The subjects were limited to those girls whose age is 18 years old or younger.
3. The subjects were limited to those girls who volunteered to participate in this study.
4. Nutrition knowledge questions in this study were limited to those related to pregnancy.
5. Results of the study were limited to pregnant teenagers who seek assistance from Margaret Hudson programs in Claremore Indian Hospital, Claremore; and Washington County Health unit, Bartlesville, and cannot be extrapolated to the population as a whole.

Definitions

1. Pregnant adolescent: Become pregnant at age 18 or younger.
2. Perinatal Nutrition: Nourishment provided by a pregnant woman for

her unborn child through diet during gestation. Includes other nutrition related, non-dietary practices, that may affect the outcome of pregnancy.

3. Primigravida: The subjects were experiencing the first pregnancy at the time of this study.
4. Recommended Dietary Allowances (RDA) for pregnancy: Estimates of acceptable quantities of essential nutrient intakes for pregnancy. Levels of intake of essential nutrients considered, in the judgement of the Committee on Dietary Allowances of the Food and Nutrition Board, National Research Council, on the basis of available needs of pregnant adult (10).
5. RDA for pregnancy during adolescence: The RDA for pregnant adolescents are accordingly formulated by adding the RDA for pregnant adult women to that for non-pregnant teenagers.
6. Fetus: The offspring in the womb from the end of the third month of pregnancy until birth.
7. Gravida: The state of having an offspring developing in the uterus.
8. Pre-eclampsia: Acute hypertension with proteinuria or edema or both appear after twentieth week of pregnancy.(11)
9. Eclampsia: Occurrence of one or more convulsions with the criteria for the diagnosis of pre-eclampsia appeared in pregnancy.(11)
10. Low birth weight infant: A newborn who weighs less than 2500 g ($5\frac{1}{2}$ lb) at birth.(11)
11. Margaret Hudson Program: A non-profit comprehensive agency, located at 1205 West Newton, Tulsa, Oklahoma. Its objective is to help the expectant school-age parent acquire adequate health care during the prenatal and postpartum periods for both herself

and baby (a brochure from Margaret Hudson Program).

12. City: An incorporated place with dwelling population of 10,000 or more.
13. Town: A dwelling place with population from about 2,500 to 10,000.
14. Rural: A country area is where the majority of people engage in agriculture pursuits. Rural area includes towns with total people fewer than 2,500.
15. Misconception Score: A nutrition or nutrition related statements which is answered incorrectly by pregnant teenagers according to scientific evidence to date.
16. Non-dietary practices: Non-food items which were consumed by pregnant adolescents. These included: pica practices and alcohol, carbonated beverage, caffeine, and cigarettes in this study.

CHAPTER II

REVIEW OF LITERATURE

Since nutrient requirements increase dramatically for adolescents during rapidly growing years, the need for good nutritional care is accentuated, particularly if pregnancy occurs during this time. A review of the emphasis of different research studies on human fetal growth, relationship of nutrition to outcome of pregnancy, dietary, and non-dietary consumption, and nutrition knowledge of adolescent girls are presented. Food, nutrition misconceptions, complications of pregnant adolescents, and education programs for school age mothers will also be discussed in this chapter.

Maternal and Fetal Growth

Normal pregnancy is accompanied by anatomical and physiological changes that affects almost every function of the body. From the medical point of view, pregnancy involves the physiological imperatives to provide a fetus optimal growth and development while maternal homeostasis can also be preserved (12,13). To meet these requirements, pregnant women need extra nutrients during gravida for optimal growth of the unborn child.

The Food and Nutrition Board of the National Research Council was well aware of the importance of determining nutrient requirements and set Recommended Dietary Allowances (RDA) for pregnancy (10). The RDA

are basically based on the best available evidences of metabolic balance studies and other indirect estimates. Requirements for most nutrients are thus set at a level that prevents signs of deficiency and also maintain nutrient intake in balance with urinary excretion. The RDA for pregnant adolescents are accordingly formulated by adding the RDA for pregnant adult women to that for non-pregnant teenagers. Table I shows RDA for pregnant teenagers 11-14 and 15-18 years of age. (10)

Meeting RDA during pregnancy is an important factor in nutrition support for appropriate prenatal development. Many researchers realized that any inadequate intake of essential nutrients could possibly have a notable impact on the health and development of the pregnant mother as well as the unborn child. Thus, the relationship of insufficient nutrients and outcome of pregnancy has been emphasized through epidemiologic, clinical, and field studies.

Relationship of Nutrition to the Outcome of Pregnancy

Findings of research studies established evidence that good nutrition was important to reproductive efficiency. The most convincing example, the relationship between good maternal nutrition and neonatal birth weight, were observed during the Second World War.

Leningrad Studies

In the Second World War, Leningrad women were not on adequate diets before the siege and used much of their ingested energy to provide body heat when doing outdoor work in cold weather. The food situation became worst from August, 1941, to February, 1942. Antonov

found that during the famine period there was a two-fold increase in fetal mortality and an increase in the number of infants weighing less than 2500 g at birth (14).

Holland Studies

In the northwest Netherlands, there was a hunger period beginning in September, 1944, and terminating with the liberation of the area in May, 1945. This hunger period was created by a transportation strike against the Nazis and resulted in the transportation of little or no food into major cities. During the famine, dietary intake dropped to less than 1000 calories/day and protein was limited to 30 or 40 g. Since the famine lasted only 6 months, babies conceived before and during it were exposed for varying lengths of time, but none was exposed for the entire course of gestation. When evaluating the statistics, Smith was able to consider how the timing of maternal dietary restrictions might affect fetal growth (15).

On the average, birth weights of infants exposed to this famine were reduced by 200g. Weights were lowest for babies exposed to the famine during the entire last half of pregnancy. Similar findings support the scientific knowledge of role of nutrition in human growth. Poor nutrition in the latter part of pregnancy affects fetal growth, whereas poor nutrition in the early months affects development of the embryo and its capacity to survive (16).

The evidences of these studies lead to the conclusions that maternal nutrition can influence reproductive performance, specially under-nourished women who have higher chances of giving birth to low birth weight infants. According to the American Academy of Pediatrics

Table I

Estimates of Dietary Needs for Pregnant Teenagers

Nutrient	Recommended intake for nonpregnant teenager, 11-14 years	Recommended intake for non pregnant teenager, 15-18 years	Recommended increment for adult pregnancy
Protein (g)	46	46	+30
Calcium (mg)	1200	1200	+400
Phosphorus (mg)	1200	1200	+400
Iron (mg)	18	18	*
Magnesium (mg)	300	300	+150
Iodine (ug)	150	150	+50
Zinc (mg)	15	15	+5
Vitamin A (ug RE)	800	800	+200
Vitamin D (ug)	10	10	+5
Vitamin E (mg TE)	8	8	+2
Ascorbic acid (mg)	60	60	+20
Niacin (mEq)	15	14	+2
Riboflavin (mg)	1.3	1.3	+0.3
Thiamin (mg)	1.1	1.1	+0.4
Folacin (ug)	400	400	+400
Vitamin B_6 (mg)	2.0	2.0	+0.6
Vitamin B_{12} (ug)	3.0	3.0	+1.0

Source: Food and Nutrition Board, National Academy of Sciences--National Research Research Council (Revised 1980).

* The increased requirement during pregnancy cannot be met by the iron content of habitual American diets nor the existing iron stores of many women; therefore the use of 30-60 mg of supplemental iron is recommended.

(4), 'low birth weight infants' is one of the major risks of teenage pregnancy. Moreover, adolescent girls are said to have the least adequate diet of any population group (5,6). Therefore, a rational approach to improve the outcome of teenage pregnancy should consider teenager's dietary habits before any nutritional advice is to be given.

Food Habits and Consumptions of Adolescents and Pregnant Adolescents

It is a common belief that many teenagers have atrocious food habits and are on the brink of nutritional disaster (6). Hence, any sound nutritional advice early in pregnancy is important to pregnant adolescents.

The food habits of adolescents reflect decreasing influence from the parental family during adolescence. Rather, the young person's increasing social involvement with her peers, and the concern about appearance predominate her food habits and consumption. Skipping meals and eating snacks are becoming characteristics of many teenage girls (6,17). Heavier girls with more total body fat have poorer diets than girls with less body weight. This may be due to lower caloric intakes (18). From the Ten State Nutrition Survey, 1968-1970, the 15-to-16 year old group had the highest proportion of calories generated from intakes between meals. Snacks approximately range up to 1/4 of the total calories for this age group (5).

In a study on the eating habits of 996 pregnant Chicago girls 15 years of age or younger, Smith et al. have found 44 percent of the diets were rated as poor, 26 percent fair, and only 30 percent good

(19). The diets were rated "good" if a girl ate foods from all four food groups and met the required amount of three food groups. The diet was rated "fair" if she ate foods from all four groups but met the required amounts of only two. The diet was rated "poor" if not all four groups were represented; or, if the four food groups were represented, but required amounts were not met which also were rated as "poor" diets. However, in comparing one specific required nutrient, a "poor" rating diet was not always lower than a "fair" rating diet. For example, the girls' diets rated as "poor" might include high percentage of RDA in Vitamin C, but did not meet the other required nutrients.

Only 12 percent of the respondents who reported being regular meal skippers were rated as having good diets. One-fifth of the subjects ate no more than two meals a day. A similar study by Drumm also showed parallel results in that, using same criteria to determine adequate diets of 27 pregnant adolescents, 59 percent had poor diets, 33 percent fair diets, and only seven percent good diets (20).

These two studies clearly indicated that diets of pregnant teenagers as a whole were less than sufficient to obtain all of the required essential nutrients during pregnancy. Are these inexpedient food habits leading to any nutritional insufficiency, such as; insufficient iron intake to anemias, in adolescent pregnancy? Many researchers have studied dietary intakes of pregnant teenagers, the results had shown high percentages of insufficient dietary intakes of pregnant adolescents.(7,8)

Nutrients Intakes of Pregnant Adolescents

Due to different research design and emphasis of areas of the

study of dietary intakes about adolescent pregnancy, the researches revealed varied results. However, nutrients which were most deficient in pregnant adolescents were calcium, iron, vitamin A, and energy (7,8).

McGanity reported that two most neglected nutrients from the studies of 861 pregnant adolescent teenagers were calcium and iron (21). Of 29 pregnant adolescents investigated, Hasen et al, found 30 percent of the subjects were below the two-thirds level of the RDA for calcium, iron, and vitamin A (22). It was not surprising that Thompson et al. advised that pregnant girls in the age of 15 to 17 years took calcium and iron supplements to ensure a safety margin of 100 percent of RDA (23).

Calcium

Calcium is an essential macronutrient, 99 percent of it is in the hard tissues, bones and teeth. The need for extra calcium during pregnancy relates largely to the development of the fetal skeletal system. According to Hytten and Leitch, approximately 28 gm of calcium are stored in the fetus at birth (24). When calcium intake ranges from 1.0 to 1.6 gm per day and vitamin D intake is about 10ug (400IU/day), the retention is approximately 400 mg per day of calcium for fetal growth without slightly depleting maternal stores, an additional 400 mg of calcium per day is desirable for the pregnant adolescents.

Iron

Iron is an essential trace mineral needed in an increasing quantity by both mother and child during the period of pregnancy. The

National Research Council has suggested 18 mg a day as the minimum intake for the nonpregnant woman during childbearing years (10). In addition to the 18 mg/day iron, a supplementation of 30 to 60 mg per day is recommended for all, pregnant women, including adolescents, to build maternal iron stores as well as replenish the iron loss during delivery (10). Dietary intake of iron was low for pregnant adolescents in Drumm's study (20). Eighty-one percent of the participants fell below the normal hemoglobin range.

Vitamin A

Vitamin A is essential to the visual process, maintenance of bone growth, and reproduction (10). A daily increase in vitamin A of 1000 IU during the last half of pregnancy is preferred as an essential factor in cell development, maintenance of the integrity of epithelial tissue, tooth formation, as well as normal bone and vision development. From a study of Morse et al., the adjusted mean of plasma vitamin A detected in younger women of 18-19 years was significantly lower than that found in older women of 20 years old or above (25).

Calories

Energy is provided from foods to maintain normal body function at all ages and it also increased during growth and pregnancy. The unit of energy commonly used in human nutrition is the calorie. Since individual adolescents differ markedly in their growth pattern, body builds and exercise routines, it is extremely difficult to predict energy requirements during pregnancy with accuracy.

Hytten and Leitch suggested that extra 330 Kcal/day during the

last three-fourths of pregnancy is needed (24). Thus estimated needs for the young pregnant teenagers become 2530 to 2730 Kcal a day, or 44 to 47 Kcal/kg day for a 58 kg girl. The RDA for energy is based on 42 to 43 Kcal/kg for the pregnant teenagers (10). The variation of recommendations is due to various size and physical status of maturing girls. And also, the recommendations for energy intake per day have to be couched in terms of other sufficient vitamins and minerals to ensure proper fetus development. The combination of ample nutrients is essential in order to be able to produce a desired accumulation of 24 to 30 pounds of maternal and fetal components during a pregnancy, plus the additional increment for the weight gain for the still maturing adolescent girl (26).

Nutrition status at the time of conception is a culmination of a girl's lifetime nutritional experience and is an important determination of reproductive efficiency. Evidence suggests that fetal-maternal competition for nutrients may deplete nutritional reserves of young primigravidas. The incidences of complications may well be related to his depletion.

Complications of Adolescent Pregnancy

According to diverse sources of studies, complications of teenage pregnancy most often reported are pre-eclampsia, anemia and inadequate or excess weight gain. These complications are often associated with inappropriated dietary care during gestation.

Pre-eclampsia

The most serious complication observed in a study by Seiller and

Fox (27) was the incidence of pre-eclampsia which occurred in 26.7 percent of 30 pregnant adolescents under investigation as compared to seven percent for the general population. The incidence of toxemia pregnancy was about twice as frequent for 12-16 year old primigravidas as it is for primigravidas in general. In another study where medical records were available for 47 girls, clinical edema was diagnosed in 14 of them (7). The major problem in cases of pre-eclampsia which was reported in the medical charts was an undesirable pattern of weight gain during pregnancy. Twenty-five girls, 53 percent, had some retention of extracellar fluid, and diuretics had been prescribed for 10 of these girls.

Anemia

Anemia is defined as a condition in which there is a decrease in the quantity of hemoglobin, in the number of red cells, in the volume of packed cells (hematocrit), or in a combination of these (24). Nutritional anemias include iron deficiency and folic acid deficiency.

A high prevalence of iron deficiency anemia among adolescents has been reported by the Ten State Nutrition Survey (5). However, this study also showed adequate folacin intake was observed for the population, while another report showed a relative high incidence of folacin deficiency was found among pregnant women in New York City (32). In comparison to the study of Bailey (33), folacin deficiency anemia among 269 low-income pregnant adolescents and women were even more prevalent than iron deficiency anemia; and the serum folacin was low (3-6ng/ml) in 48 percent of all subjects and deficient (less than 3ng/ml) in 25 percent of the subjects.

In addition to iron and folacin, vitamin B_{12} and vitamin B_6 are also involved in hemoglobin sythesis. Vitamin B_{12} status of adolescents was normal in previous studies (30). However, among 127 low-income pregnant adolescents and women, vitamin B_6 status has been reported poorly supplied (31). The mean dietary intake of Vitamin B_6 of the subjects at the first prenatal visit was only 53 percent of the RDA level, though protein and energy intakes seemed adequate.

Inadequate and Excess Weight Gain

Maternal weight gain during pregnancy is associated positively with fetal growth (32). Generally, 1 kg of maternal weight during pregnancy correlates to 20 to 25 g increment above unadjusted mean birthweight of the baby. The Maternal Nutrition Research Council recommended 24 pounds increase as the normal weight gain which is considered as a desirable obstetric performance (33).

Low maternal weight gain during pregnancy often indicates a higher incidence of low birth weight infants and higher mortality rates among neonates born to teenage mothers (34). Although recorded weight gain of adolescent mothers may range from 15 to 43 pounds, 50 percent of the girls in this study gained more than 25 pounds (35).

On the other hand, the extra weight gain was normally associated with excess calories intake, particularly in the second trimester of the pregnancy (36). Another factor such as the length of gestation, has been determined to be responsible for excess weight gain among 98 pregnant women, age 12 to 32, according to the study of Ancri et al. (35).

Other factors, such as alternative food patterns of pregnancy,

also influence fetal outcome. Recently, National Academy of Sciences, National Research Council's (NAS/NRC) has addressed non-dietary practices affecting pregnancy in its report "Alternative Dietary Practices and Nutritional Abuses in Pregnancy" (37).

Maternal Factors Affecting Pregnancy

The recommendations of NAS/NRC are based on the available scientific information about the results of the alternative dietary practices. The selected maternal factors, age, smoking, alcohol, caffeine, pica were summarized in this section.

Age

A critical factor in the outcome of pregnancy is maternal age at the time of conception (40). In the United States, the average age at menarch is 12.5 to 13 years. About four years later, or around 17 years of age, the majority of girls have completed linear growth and have achieved gynecologic maturity. Girls are at biological risk, if pregnancy occurs before cessation of growth. Therefore, the Committee on Maternal Nutrition, National Research Council, defined that girls who became pregnant before they were 17 years of age were at biological and psychological risk (33).

Smoking

It has been well known that cigarette smoking during pregnancy may contribute to the increased incidences of low birth weight, prematurity, and infant mortality (39,40). The oxygen-carrying capacity of the blood in both mother and fetus is reduced in women who smoke

during pregnancy (41).

Smoking is one of the most important preventable determinant of low birth weight in the United States. Maternal smoking has an adverse effect on birth weight. Infants of smoking mothers weigh on the average 200 g less than babies born to mothers who do not smoke (39). However, one-third of females between 17 and 18 years of age smoke cigarettes, which informed by Edwards et al., aroused concerns to the nutrition educators about the fact (42). The fact is that these young women enter their childbearing years with frequent smoking and unrealistic dieting for maintaining below normal body weight. The consequence from unreasonable low body weight could be a limit to the fetal parasiticity. The size and quality of the offspring will be compromised from the fact of poor nutrition status.

Alcohol

Fetal damages associated with alcohol intake during pregnancy are very common (43,44,45). Jones et al. have described a unique set of characteristics of infants born to women who were chronic alcoholics (43). These infants showed certain anomalies of eyes, nose, heart, and central nervous system that were also accompanied with growth retardation, small head circumference, and mental retardation. The anomalous characteristics were named "fetal alcohol syndrome" (FAS).

Thirty to fifty percent of chronic alcoholic mothers delivered infants with FAS has been estimated by Hanson (46). Although infrequent or modest alcohol ingestion may not constitute a hazard to the fetus, there are insufficient data to quantify "infrequent" and "modest" in terms of specific recommendations. Therefore, because a "safe" level

of alcohol intake for pregnant women has not been established, the NAS/NRC's recommendation is to advise against alcohol intake during pregnancy (37).

Caffeine

Caffeine is consumed as an ingredient in coffee, tea, chocolate, cola, some soft drinks, and medications such as over-the-counter drugs (37). The recent concern and controversy related to caffeine possible detrimental effects in pregnancy stem from the well-known facts that caffeine: 1) is an active central nervous system stimulant, 2) has a drug-like effect, and 3) readily crosses the placenta to reach the fetus (40).

Data from a few epidemiological studies of caffeine intake in human pregnancy are available, but the results are inconclusive, mostly because of incomplete information concerning one or more of the following important variables: the amount and length of caffeine consumption, alcohol intake, smoking habits, age at pregnancy, outcome of prior pregnancies, medications, and illnesses during pregnancy. In a recent study by Linn et al. (47) suggested that caffeine may pose no significant risks when other confounding variables were controlled.

Pica

Pica, the eating of clay, dirt, cornstarch, paint and other similar items may be harmful. Ingestion of these could replace nutritious foods and could introduce harmful bacteria or lead into the body system. Pica of pregnancy is most often reported as consumption of dirt and clay (geophagia) or starch (amylophagia) (37). The reasons

for the ingestion of cornstarch or clay are either a traditional practice handed down through generations or a desire for relaxation, appetite stimulation or sheer chewing pleasure.

Payton et al. used prenatal dietary records of 571 expectant mothers through pregnancy to assess nutritional status and dietary habits (48). Seventeen percent of subjects reported pica practices, one case was reported of eating dirt, the rest of the subjects ate starch at home. The implications of various pica practices in terms of pregnancy outcome are unknown, although there are indications that the nutritional status of the mother may be adversely affected by displacing other nutritional foods in the diet. The incidences of anemia due to pica during pregnancy have been reported (37). However, the relationship between pica and iron deficiency anemia remains obscure.

These predominances of deleterious dietary and non-dietary practices could lead to misleading maternal nutrition beliefs during pregnancy. Therefore, exploring the nutrition misconceptions held by adolescent girls could be benefit in designing the questionnaire of perinatal nutrition misconception of pregnant adolescents.

Food and Nutrition Misconceptions of Adolescents

Nutrition misconceptions have been widely studied by many researchers. Since, the main target sample for this study was pregnant adolescents age 18 or under, the review of misconception studies are only limited to the school age girls.

A misconception can be defined as "a belief commonly held as true but which is not in accord with scientific evidence to date " (49).

This also includes fallacies, fads, and half-truths. Misconceptions often times arise from inadequate learning or insufficient information (50). Nutrition knowledge can pose a potentially serious threat to health when subject to various misinterpretations and misinformations among teenagers.

The aptitude of 4-H youth to distinguish nutrition fallacies from true facts has been revealed by Wang (49). A significant difference in the mean scores of nutrition test was found between two low-income groups and two other middle income groups. The differences in level of nutrition knowledge were attributed to different levels of education as well as to various experiences.

Dzenowagis et al.(51) studied the health and safety misconceptions of 250 tenth grade girls in a Massachusetts city. In this study, 25 percent or more of the girls agreed to 111 of 126 misconceptions.. The misconceptions held in the area of nutrition were not scored separately from total misconception scores. But nearly 7 of 10 of the girls believed that "any food that does not smell or taste spoiled is safe to eat." More than half of the girls believed that "taking vitamin pills will guarantee you good health," and half of these same girls believed that "vitamins in certain pills are better than vitamin in natural foods." One of every two girls believed that "persons can clean their blood by eating certain foods".

On the contrary, Wodarski (9) found no significant differences in nutrition misconceptions in terms of grade levels among 185 Knoxville, TN students. The same result was also true in other studies. Harrison and Irwin (52) Funderburg (53) found no significant differences among grade level scores.

Deficiencies in nutritional knowledge of teenage girls were suggested from the results of various studies (9,14,54). These young females are generally psychologically and socially prone to nutritional problems. Their needs for expression of independence and peer group norms for weight and clothing size lead to severely curtailed intakes of essential nutrients. They also intend to obtain most unscientific misinformation from a variety of sources, trying to maintain an unrealistic less-than-normal weight.

Apparently, the attempt to understand the nutritional misconceptions of pregnant adolescents becomes more important, since these misconceptions if not understood or corrected, will impose undesirable effects when right decisions are made to improve both her and her baby's health. The investigations of prevalent misconceptions among pregnant adolescents can further assist health professionals in identifying the educational needs for the girls. The improvement of education strategies in an educational program is believed to be the most effective and feasible means in helping pregnant adolescents overcome physiological and psychological problems during pregnancies.

Education Programs for Pregnant Adolescents

Adolescent pregnancy and its associated problems began receiving national attention in the early 1970's. During that period of time, government and private agencies assumed the responsibility for bringing these phenomena to the attention of professional audiences and general public (55).

Prior to the 1970's, adolescent pregnancy had been reorganized as a nationwide problem which required a type of professional jointed-

effort treatment, rather than as something to be swept under the rug (55). Due to the efforts of many professionals, model of special design of schools for pregnant school-age girls combined the educational, medical, and social needs.

Jackson Public Schools, Jackson, Mississippi, started from September, 1971 to July 1976 (56). An attempt was made to determine project success in a survey during 1975. Eighty percent school retention rate was reported in the Adolescent Pregnancy Center in Jackson, Mississippi, in spite of pregnancy was cited as the most common reason for teenage female school discontinuation (57).

Evidences also had shown that pregnant girls attended at the special school program had better obstetric performances than the girls who were not in the school program (58). A reduction in the proportion of low-birth-weight infants and neonatal deaths had been suggested by the observations of Stine and Kelly at Baltimore City Public Schools (59). Receiving early prenatal care and experiencing longer gestation periods among pregnant adolescents were also reported at the same study.

The situation of school for pregnant adolescents were relatively free of stress. The girls received considerable emotional support from staff and from other peers. The atmosphere was relaxed and non-punitive. In addition, medical and social services were readily available through the intervention of nurses and social workers. All of these associated factors stated above contributed the positive effect of a special school for teenage mothers in improving the health of the mothers, as well as of the infant.

Survey revealed that progress had been made in the provision of

services to pregnant teenagers and their babies. Some available estimates suggest that fewer than one-half of the pregnant youth are being served by any kind of social services (59). Therefore, in order to keep the present level of services to pregnant teenagers, the well-planned programs should be preserved.

In most situations where good programs have been well established, more efforts should be directed to upgrade and improve the program's function. According to the current needs of the population and educational systems' strengths and defects, the future programs need further improvements in bringing more comprehensive and interdisciplinary services to both teenage mother and baby. The particular problems associated with adolescent pregnancy shall not be restricted by limited numbers of programs; they are collaborated responsibilities from different health professionals, educators, the community, the teenager and her family. All must participate together to devise a better program toward the objective of preventing the pregnant adolescents from avoidable and undesirable burdens of socioeconomic, physiological, and psychological change during pregnancy.

Summary

The pregnant adolescent is of major concern of health professionals because of the biologic, psychologic, and sociologic factors that frequently complicate the situation. Most pregnant adolescents have not reached physical maturity; and, from the nutritional aspect, their bodie's demand for nutrients to support their and babie's biological development are complex.

Eating habits of most the adolescents differ from those of

adults. Frequent between meal snacks and meal skipping characterize this age group. The poor eating habit leads to the nutritional concerns of pregnant teenagers. The most poorly supplied nutrients in pregnant adolescents were found to be calcium, iron, vitamin A and energy.

Fetal-maternal competition for nutrients may deplete nutritional reserves of teen mothers. The complications of pregnant teenagers may be related to this depletion. The complications are pre-eclampsia, anemia and inadequate or excess weight gain.

There are a number of well-planned programs which have been successfully designed by professionals. Improvement of the program's functions is needed. The challenge for the future in most education programs is to describe educational system strength and deficits to establish comprehensive interdisciplinary services in accordance with the needs of the population served.

CHAPTER III

METHODS AND PROCEDURES

Food and nutrition misconceptions of adolescent girls have been identified in several studies (9,51,52). However, there were lack of researches in the subjects of perinatal nutritional misconceptions among adolescents in previous studies. Hence, this study was conducted to identify the perinatal nutrition misconceptions held by selected pregnant adolescents in Oklahoma.

Type of Research Design

A descriptive research design was to determine the prevalence of perinatal nutrition misconceptions among selected pregnant adolescents in Oklahoma. A questionnaire to identify the background information of the respondents, and nutritional knowledge related to pregnancy was administered. These findings can be used to develop education programs which assist pregnant adolescents to meet their nutritional needs.

Population and Sampling

Pregnant adolescents in Oklahoma, 18 years old or under who were participants in the Margaret Hudson Program in Tulsa, Oklahoma, a selected Indian Health Service (IHS) clinic in Claremore, Oklahoma, and the Washington County Health Unit, Bartlesville, constituted the sample for this study. The participants from the IHS clinic were obtained

from Claremore Indian Hospital. A total of 70 pregnant teenagers volunteered to participate in the study during June and September, 1983.

The Instrument

The review of literature served as the basis for the development of the questionnaire used in this study. The perinatal knowledge questions were modified from Schwartz and Baryans (60). The questionnaire was developed in two parts. Part I included questions to obtain demographic information, information about pregnancy, non-dietary practices, enrollment in Home Economics courses and sources of nutrition information, Part II consisted of 30 "true, false, or don't know" questions pertaining to perinatal nutrition (Appendix A). The purpose of "don't know" score in the questionnaire is to eliminate the chances of guessing in nutrition statements. Questions pertained to three areas of perinatal nutrition. These were: (1) role of nutrients and caloric needs, (2) food composition, (3) dietary practices during pregnancy.

The instrument was pretested with five pregnant adolescents participating in Expanded Food Nutrition Education Program (EFNEP), Muskogee, Oklahoma. The results of pretest showed that two girls did not know their mothers' education levels. Therefore, the choice of answer "don't know" was added on Question 3 on the first part of the questionnaire. One of the five girls circled more than one choice on two questions in perinatal nutrition. So, the statement "circle only one choice", was added to the directions on Part II of the questionnaire. All five girls expressed that they did not have any

problem in understanding the questions, and completed the questionnaire in 15-20 minutes.

The content validity of perinatal nutrition statements was obtained by Q-sort method. A panel of experts in nutrition assessed the content validity of questionnaire. The panel consisted of a county extension Home Economist, a master's degree student in food and nutrition, and an associate professor in Department of Food, Nutrition, and Institution Administration. Instructions were given to each panel member. They were asked to sort the 30 statements into four different envelopes. The four different envelopes had titles: role of nutrient and caloric needs, food composition, dietary practices during pregnancy and unable to categorize. The criterion of sorting nutrition statements was to select the appropriate perinatal nutrition area for each of the 30 nutrition statements. Each nutrition statement was included in questionnaire, only if 2 out 3 of the panel members agreed on the area of perinatal nutrition.

Administration of the Questionnaire

Permission to collect data for the study was obtained through the Directors of the following programs: Nutrition Branch of Indian Health Service, Tulsa Public Schools, and Washington County Health Unit. (Appendix B) Cooperation was acquired through phone from the following persons: the dietitian of Claremore Indian Hospital, the director of Margaret Hudson Program, and the Public Health nurse of Washington County Health Unit. Administration of the questionnaires was set up according to the convenience of each program. Researcher administered the questionnaires at Claremore Indian Hospital and Washington County

Health Unit during June, 1983, and Margaret Hudson Program during September, 1983. At the time of administering the questionnaire, each participant was given a packet of nutrition education materials, Oklahoma State University pencils, and a note pad to motivate them to participate in the study. Instructions for responding to the questionnaire were printed on the first page of the instrument, and they also were given orally. If a respondent asked a question about the meaning of a word, she was given the explanation. Otherwise, the participants did not receive any other instructions during the period of responding to the questionnaire.

Scoring Responses of Nutrition Statements

Two different scores were used to determine nutrition knowledge scores. These were: total score, and misconception score. A total score was obtained for determining the level of nutrition knowledge of the respondents. A total score for each respondent was calculated according to:

.Correct answer = 2 points
.Wrong answer = 0 point
.Don't know answer = 1 point

A total possible score was 60. See Appendix C for the key of the nutrition knowledge statements. A score for each of three categories was calculated in same formula as stated above. A total possible score for each category was 20.

The misconception score was used in statistical analyses of hypotheses testing. The misconception score was the sum of total wrong answers to the 30 statements. The total possible misconception score

was 30. A misconception score for each category was also obtained to determine the area of prevalent misconceptions. The total possible misconception score was 10 for each category.

Analyses of Data

Frequency and percentage were obtained from the responses to the demographic information, background information, information about pregnancy, non-dietary practices, and sources of nutrition information. Misconception scores were used in testing the hypotheses to determine the association of nutrition knowledge and selected variables, such as, the number of pregnancies, trimester of pregnancy, age and mother's education level.

The analysis of variance and Duncan's Multiple Range Test were the statistical techniques used to determine the significance of the association. The confidence level, .05 level, was used to accept for reject the results.

CHAPTER IV

RESULTS AND DISCUSSION

The sample in this study consisted of pregnant adolescents who participated in the Margaret Hudson Program, Tulsa, Oklahoma, Claremore Indian Hospital, and Washington County Health Unit, Bartlesville, Oklahoma, during June and September, 1983. The analysis of sample, its demographic variables, and the associations between the misconception scores and selected variables follows.

Background Information

Race and Age

Of the 70 respondents in this study, 25 were white, 27 black, and 18 belonged to other ethnic groups (16 American Indians, and 2 Hispanics). The percentages of white, black, and American Indians in this study were proportionally distributed. See Table II.

The girls ranged in age from 13 to 18 years, and the average age was 16.5 years. See Table III. The largest percentage of the participants (40,56%), were 17 and 18 years old. Thirty girls (44%) were under 17 years old. This age group was determined by Committee of Maternal Nutrition, National Research Council to be at biological and psychological risk (33).

TABLE II

NUMBER AND PERCENTAGE OF SUBJECTS ACCORDING TO ETHNIC GROUPS

N=70

Ethnic Groups	Number	Percent
White	25	35.7
Black	27	38.6
American Indians	16	22.9
Hispanics	2	2.8
Total	70	100.0

TABLE III

NUMBER AND PERCENTAGE OF SUBJECTS ACCORDING TO AGE

Age of Subjects	Number	Percent
13 years	2	3.8
14 years	3	4.2
15 years	10	14.2
16 years	15	21.4
17 years	22	31.4
18 years	18	25.0
Total	70	100.0

Grade Levels

Most of participants (49,70%) were enrolled in the 10th grade or above, 21 girl (30%) had finished 9th grade, and 7 (10%) had finished 8th grade or even less. See Table IV.

TABLE IV

NUMBER AND PERCENTAGE OF SUBJECTS BY GRADE LEVEL

Grade Level	Number	Percent
12th	12	17.1
11th	19	27.1
10th	18	25.7
9th	14	20.0
8th	7	10.0
Total	70	99.9*

*In this and subsequent tables any difference in total from 100 percent is due to rounding.

Residency

Over one-half of the subjects, 38 (56%), lived in a city with a population of 50,000 or more, and 5 (7%) lived in a city with a population less than 50,000. Of the subjects 13 (19%) lived in a small town with population from 2,500 to 10,000, and 12 (18%) resided in the country area with population less than 2,500. See Table V.

TABLE V

NUMBER AND PERCENTAGE OF SUBJECTS ACCORDING TO RESIDENCY

Residency	Number	Percent
City, more than 50,000	38	55.9
City, less than 50,000	5	7.1
Town, less than 10,000	13	18.6
Town, less than 2,500	7	10.0
Rural	5	7.4
Don't know	2	2.8
Total	70	99.9

Mother's Education

The participants were asked to identify the level of education obtained by their mothers. According to the responses, the majority of the girls' mothers (55%) had at least high school diplomas, but 28 percent of the girls' mothers had not finished high school. Percentage of responses in rank order according to level of mothers' education were:

Level of Education	Percent
Finished high school	38.5
Between 9-11 grade	22.9
Don't know	17.1
Some college education	10.0
Completed college degree	7.1
Less than 9th grade	4.2

Information about Pregnancy

Number and Stage of Pregnancy

Because of the high incidence of repeated pregnancy among adoles-

cents (61.62), the subjects were asked to report the number of times they had been pregnant. Most of the participants, 61 (87%), were pregnant for the first time. The remaining subjects, 9 (12%), had one or two previous pregnancies.

The stages of pregnancy for the subjects were shown in Table VI. Thirty-two (47%) were in the second trimester, 19 (28%) were in the first trimester, and 17 (25%) were in the third trimester at the time of this study. See Table VI.

TABLE VI

NUMBER AND PERCENTAGE OF SUBJECTS ACCORDING TO FREQUENCY AND TRIMESTER OF PREGNANCY

Frequency of Pregnancy	Number	Percent
First time	61	87.1
Second time	8	11.4
Third time	1	1.4
Total	70	99.9
Trimester of pregnancy		
First	19	27.2
Second	32	45.7
Third	17	24.2
Don't know	2	2.8
Total	70	99.9

Prenatal Care

Studies (61,62) identified that many pregnant adolescents delayed seeking prenatal care in the pregnancy, therefore the time of initiation of prenatal care was identified for this study.

Over one-half of the girls, 44 (63%), obtained prenatal care during the first trimester, 16 subjects (23%) during the second trimester, and 5 (7%) delayed prenatal care until the third trimester. At the time of this study, 65 (93%) girls were receiving prenatal care from a physician. Only 5 (7%) were not receiving prenatal care.

Problems of Pregnancy

The most common physical health problems reported by respondents included headaches, 24 (35%); fainting/blackout, 19 (27%); and vomiting 18 (26%). The reported physical ailments in Graven's study (62) were higher than the results of this study. The most frequent physical health problems encountered by participants in this study during their pregnancies in rank order were:

Problems of Pregnancy	Percent
Headaches	34.3
Fainting/blackout	27.1
Vomiting	25.7
Constipation	17.1
Diarrhea	8.6
High blood pressure	2.9

Non-Dietary Practices

Certain non-dietary practices may effect the outcome of pregnancy as reported in previous studies (40, 42, 46). These factors were pica

practices, the use of alcohol and cigarettes, and the beverage consumption were obtained from the participants in this study. See Table VII.

Pica

Eight (11%) respondents reported that they had pica practices during pregnancy. Among these, six of the girls (9%) ate starch. The other two respondents reported eating clay and dirt respectively. Similar results were shown in Payton's study (48) where 17 percent of the subjects reported pica practices.

Alcohol

Approximately one out of six respondents, 12 (17%) consumed alcohol during pregnancy. No one drank alcohol beverage every day, all of the reported subjects consumed alcohol in infrequent ways. In Graven's study (61), the responses of alcohol consumption, 3% of the total subjects, were considerably lower than the result of this study (17%).

Carbonated Beverage

Almost every girl, 69 (99%) reported that she drank carbonated beverages during pregnancy. About one-fifth of the respondents, 15 (21%) drank three bottles or more a day. Nearly one-half of the respondents, 32 (46%) drank 1 to 2 bottles a day. One-third of the respondents, 22 (31%), drank less than one bottle a day.

TABLE VII

NUMBER AND PERCENTAGE OF NON-DIETARY PRACTICES AS REPORTED BY THE SUBJECTS

N=70

Non-dietary Practices	Number	Percent
Pica		
clay	1	1.4
starch	6	8.6
dirt	1	1.4
Total	8	11.4
Beverage Consumption		
Alcohol beverage		
once a week	2	2.8
once a month	4	5.7
once a year	4	5.7
no response	2	2.8
Total	12	17.1
Carbonated Beverage		
1 bottle/day	22	31.4
1-2 bottles/day	32	45.7
3-4 bottles/day	13	18.5
4 bottles/day	2	2.8
Total	69	98.5
Coffee		
1 cup/day	9	12.8
1-2 cups/day	6	8.6
3-4 cups/day	1	1.4
Total	15	21.4
Cigarettes		
1 pack (<)	16	23.0
1-2 packs	5	7.0
Total	21	30.0

Coffee

Coffee consumption appeared to be low among the adolescents. Fifteen girls (22%) reported drinking coffee, 9 (12%) drank less than one cup a day, and 6 (8%) drank 1-2 cups a day.

Cigarettes

About one out of three respondents, 21 (30%) smoked cigarettes; but most of the girls, 16 (23%) smoked less than 1 pack a day. But, according to the results of the nutrition statements, the majority of the participants (98%) knew that smoking and drinking were likely to affect baby's health. It appeared that knowledge about the effects of smoking and drinking and practices were not positively correlated.

Enrollment in Home Economics Courses and Other Sources of Nutrition Information

Fifty-five (77%) girls reported that they had taken Home Economics classes at school. Of these 55 girls, 31 (44%) had Home Economics classes in 7-9th grade and 17 (24%) at both 7-9th and 10-12th grade. Percentage of responses in rank order according to enrollment of Home Economics courses:

Enrollment of Home Economics	Percent
7-9th grade	44.3
7-9th and 10-12th grade*	24.2
10-12th grade	5.7
4-6th grade	2.8
4-6th and 7-9th grade*	1.4

*Subjects were asked to report all of the Home Economics courses at schools.

The sources of nutrition information used by the subjects in

decreasing order: parents (77%), doctors (54%), and pamphlets (37%). These results indicated that nutrition education for parents and doctors were important for the pregnant adolescents. Miscellaneous sources of information from husband's parents, pharmacist, and other health professional, counted 4 percent. See Table VIII.

TABLE VIII

SOURCES OF NUTRITION INFORMATION USED BY SUBJECTS ACCORDING TO NUMBER AND PERCENTAGE

N=70

Sources of Information	Number	Percent
parents	54	77.1
doctors	38	54.2
pamphlets	26	37.1
nurse	24	34.3
relatives	19	27.1
grandparents	17	24.3
hospital dietitian	14	20.0
magazines	13	18.5
neighbors	8	11.4
library books	6	8.6
Home Economics teacher	5	7.1
others	4	5.7
newspaper	3	4.3
county extension Home Economist	3	4.3

*Subjects could list more than one source, so the percentages do not equal 100%

Mean Total Scores of Nutrition Knowledge

A mean total score was obtained for the purpose of determining the level of subject matter area of the nutrition knowledge. A total possible score for each category was 20 and for the sum of three categories was 60. These were calculated according to formula identified in Chapter III. See Table IX.

TABLE IX

DISTRIBUTION OF NUTRITION KNOWLEDGE MEAN RAW SCORES AND PERCENTAGE OF MEAN TOTAL SCORE ACCORDING TO CATEGORIES

N=70

Nutrition Knowledge	Possible Score	Mean Score	% of Mean Score
Role of nutrients and caloric needs	20.0	15.0	75.0
Food composition	20.0	14.4	72.0
Dietary practices	20.0	13.0	65.0
Total	60.0	42.4	70.6

Questions pertaining to role of nutrients and caloric needs received the highest mean score, 15.0 or 25 percent of the total possible score. Questions about dietary practices had the lowest mean score, 13.0 which represented 22 percent of the total possible score.

The mean total score of the subjects was 42.4 which represented 71 percent of the total possible score. The results indicated that the pregnant adolescents possessed some perinatal nutrition knowledge. However, nutrition education for pregnant adolescents is still needed, especially in the area of dietary practices during pregnancy.

Analyses of Responses to Nutrition Knowledge

The frequency and percentage of responses were used to determine the questions which were most often answered correctly, most often missed, and most often identified as "Don't Know". A list of the frequency of responses to each nutrition statement is identified in Table XXI (Appendix D). Nineteen of the 30 statements were answered correctly by 50 percent or more of the subjects (Table X).

Almost all of the subjects (98%) knew that smoking and drinking were likely to affect the health of the baby. The majority of the girls (93%) were aware that eating a variety of foods from basic 4 each day is the best way to get all the nutrients during pregnancy. Eighty percent of the girls knew that following a proper diet was as important as taking nutrient supplements prescribed by a doctor.

The food sources and functions of calcium were known by about 70% of the subjects. And, 63 percent of the girls were aware that the food from meat group could build and repair mother's and baby's cell tissue. Sixty percent of the girls knew that canned vegetables contained more salt than fresh vegetables. And, 73 percent knew that too much salt intake could cause water retention in the body.

About three-fourths (74%) of the subjects recognized that the proper weight gain during pregnancy was 25-30 pounds. About 65 percent

TABLE X

RANK ORDER OF STATEMENTS IN TERMS OF CORRECT RESPONSES TO NUTRITION KNOWLEDGE STATEMENTS ACCORDING TO NUMBER AND PERCENTAGE

N=70

Item No.	Statements	Category	Number	Percent
28.	Effects of smoking and drinking	Dietary Practices	69	98
1.	Importance of eating basic 4	Role of nutrients and caloric needs	65	93
27.	Importance of dietary habits	Dietary practices	63	90
24.	Importance of following a proper diet	Dietary practices	56	80
15.	Nutrient contents of green leafy vegetables	Food composition	55	79
3.	Food choices during pregnancy	Role of nutrients and caloric needs	53	76
4.	Weight gain during pregnancy	Role of nutrients and caloric needs	52	74
29.	Effects of coffee consumption	Dietary practices	51	73
21.	Problem of excess intake of salt	Dietary practices	51	73
10.	Functions of calcium, phosphorous, and vitamin D	Role of nutrients and caloric needs	51	73
9.	Reasons of extra iron requirements	Role of nutrients and caloric needs	47	67
12.	Food sources of calcium	Food composition	47	67
25.	Problem of excess weight gain	Dietary practices	46	65
16.	Nutrient contents of potato chips	Food composition	45	64
26.	Problem of inadequate weight gain	Dietary practices	44	63
13.	Food composition of meat group	Food composition	44	63
20.	Food composition of canned vegetables	Food composition	42	60
17.	Food composition of carbonated beverages	Food composition	39	56
19.	Food composition of fruit juices	Food composition	37	53

of the girls knew that too much weight or too little weight gain are not appropriate for mother and baby. Although the effects of caffeine on outcome of human pregnancy were inclusive, about three-fourths of the girls (73%) believed that too much coffee during pregnancy could be harmful to baby.

The frequency of responses to those statements which were answered incorrectly by 30 percent or more of the subjects, are listed on Table XI. Six statements were answered incorrectly by 30 percent or more of the subjects. Three statements pertained to dietary practices, 2 statements to the role of nutrients and caloric needs, and 1 statement to food composition.

TABLE XI

RANK ORDER OF STATEMENTS IN TERMS OF INCORRECT RESPONSES TO NUTRITION KNOWLEDGE STATEMENTS ACCORDING TO NUMBER AND PERCENTAGE

N=70

Item No.	Statements	Category	Number	Percent
22.	Importance of vitamin pill during pregnancy	Dietary practices	54	77
30.	Importance of good nutrition before pregnancy	Dietary practices	29	41
2.	Eating for two during pregnancy	Role of nutrients and caloric needs	26	37
11.	Foods Sources of calories content	Food composition	23	33
23.	Craving during pregnancy	Dietary practices	23	33
6.	Quantity of daily milk intake	Role of nutrients and caloric needs	21	30

Over three fourths (77%) of the girls believed that one vitamin pill a day was a way to remain in good health during pregnancy. However, 30 percent of the girls did not realize that 5 to 6 glasses of milk a day should be included during pregnancy. Forty-one percent of the girls did not know that good nutrition before pregnancy would affect the health of the baby. Also, an old saying "Eating for two" was believed by 37 percent of the girls.

The responses to those statements which were answered "don't know" by 30 percent or more of the subjects, are listed on Table XII. Six statements were marked as "don't know" by 30 percent of the subjects. Four statements pertained to the category of food composition, and 2 statements pertained to the category of role of nutrient and caloric needs.

TABLE XII

RANK ORDER OF "DON'T KNOW" RESPONSES TO NUTRITION KNOWLEDGE STATEMENTS ACCORDING TO NUMBER AND PERCENTAGE

N=70

Item No.	Statements	Category	Number	Percent
5.	Amount of calories increased during pregnancy	Role of nutrients and caloric needs	54	77
14.	Function of bread and cereal	Food composition	41	59
8.	Dietary recommend-ation (egg)	Role of nutrients and caloric needs	34	49
17.	Nutrient content of carbonated beverage	Food composition	27	39
20.	Nutrient content of canned vegetables	Food composition	22	31
19.	Nutrient content of fruit juices	Food composition	21	30

Two statements, a daily increase of 300 calories and one egg a day are recommended during pregnancy, were answered as "don't know" by 77 percent, and 49 percent of the subjects respectively. More than 50 percent (59%) of the respondents did not know the function of bread and cereals. Almost 40 percent (39%) of the respondents were not certain about the mineral content of carbonated beverage. Vitamin C content of fruit juices and salt content of canned vegetables were answered "don't know" by about one-third of the subjects.

Mean Misconception Scores According to Number of Pregnancies

The misconception score was used in statistical analyses of hypotheses testing. The first hypothesis was tested:

H_1: There will be no association between the mean misconception scores of the respondents and the number of pregnancies.

The respondents were divided into two different groups, primigravida and non-primigravida. The primigravida group consisted of respondents who were in their first pregnancy, and non-primigravida group were those who were in their second or third pregnancy. See Table XIII.

In comparing the misconception score of two groups, the score on non-primigravida was higher than the score of primigravida group. Analysis of variance indicated a significant association at $<.05$ level between the misconception score of the respondents and number of pregnancies. Hypothesis I was rejected. Those who were pregnant for the first time had significantly fewer misconceptions than those who were pregnant for the second or third time, according to Duncan's Multiple Range Test. Duncan's Multiple Range Test was used to determine

any significant differences of misconception scores among tested groups.

The mean misconception scores of three categories by number of pregnancies were tested by analysis of variance. A significant association was found at <.05 level in the category of dietary practice. Those who were pregnant for the first time had significantly fewer misconceptions than those who were pregnant for the second or third time, according to Duncan's Multiple Range Test. See Table XIV.

Mean Misconception Scores According to Trimester of Pregnancy

In attempt to identify the influence of trimester of pregnancy on misconception scores, statistical analysis were performed for the respondents who stated their stages of pregnancy in this study. The second hypotheses was tested:

H_2: There will be no association between the mean misconception scores of the respondents and the trimester of pregnancy.

The analysis of variance and Duncan's Multiple Range Test were used to test the null hypothesis of significant association between the trimester of pregnancies. The findings are reported in Table XV. The F-value obtained from analysis of variance showed that no significant association between misconception scores and the trimester of pregnancy, at <.05 level. Hypotheses 2 was not rejected.

The mean misconception scores of three categories by trimester of pregnancy were tested by analysis of variance. A significant difference was found at <.05 level in the category of role of nutrient and caloric needs. See Table XVI. According to Duncan's Multiple

TABLE XIII

ANALYSIS OF VARIANCE OF MISCONCEPTION SCORES ACCORDING TO THE NUMBER OF PREGNANCIES

Mean Score	Primigravida n=61	Non-Primigravida n=9	F-value
Misconception	5.1	7.1	4.37 *

*Significant at <.05 level.

TABLE XIV

ANALYSIS OF VARIANCE FOR MISCONCEPTION SCORES OF THREE CATEGORIES ACCORDING TO NUMBER OF PREGNANCIES

N=70

Categories	Misconception Score		F-value
	Primigravida n=61	Non Primigravida n=9	
Role of nutrient and caloric needs	1.3	1.6	0.49
Food composition	1.2	1.7	2.13
Dietary Practices	2.6	3.7	5.74*

*Significant at <.05 level.

TABLE XV

ANALYSIS OF VARIANCE FOR MISCONCEPTION SCORES ACCORDING TO TRIMESTER OF PREGNANCY

N=68

Mean Score	Trimester			F-value
	1st n=19	2nd n=32	3rd n=17	
Misconception	4.9	4.9	5.7	0.66

P=<.05

TABLE XVI

ANALYSIS OF VARIANCE FOR MISCONCEPTION SCORES OF THREE CATEGORIES ACCORDING TO TRIMESTER OF PREGNANCY

N=68

Categories	Misconception Scores			F-value
	1st n=19	2nd n=32	3rd n=17	
Role of nutrients and caloric needs	1.2	1.0*[a]	1.9[a]	3.05
Food composition	1.5	1.2	1.0	0.83
Dietary practices	2.2	2.7	2.8	1.21

*Means for score in a row of the table that have a common subscription are significantly different from each other at <.05 level.

Range Test, the misconception scores of girls in their third trimester of pregnancy were significantly higher than the scores for those in the second trimester. This could be due to the increased exposure to nutritional misconceptions as the girls progress through pregnancy. Or, respondents who were in third trimester inclined to guess more in this study than the respondents who were in second trimester.

Misconception Scores According to Age of the Subjects

The third hypothesis:

H_3: There will be no association between the mean misconception scores of the respondents and age of respondents.

Respondents were divided into two groups. Group one included subjects who were age 16 or younger, and group two included age 17 or older. F-value which obtained from analysis of variance showed that no significant association between misconception scores and age of the respondents, at <.05 level. See Table XVII. Hypothesis 3 was not rejected. Although, the mean misconception scores of two different groups were not significantly different, the misconception scores of younger group (13-16) appeared somewhat higher than the older group (17-18).

The mean misconception scores of three categories by age of the respondents were tested by analysis of variance. A significant difference was found at <.05 level in the category of food composition. See Table XVIII. According to Duncan's Multiple Range Test, the misconception scores of girls in age 13-16 group was significantly

TABLE XVII

ANALYSIS OF VARIANCE FOR MISCONCEPTION SCORES ACCORDING TO AGE

N=70

Mean Score	Age 13-16 n=30	Age 17-18 n=40	F-value
Misconception	5.5	5.2	0.35

P=<.05

TABLE XVIII

ANALYSIS OF VARIANCE FOR MISCONCEPTION SCORES OF THREE CATEGORIES ACCORDING TO AGE

N=70

Categories	Misconception Scores		F-value
	Age 13-16 n=30	Age 17-18 n=40	
Role of nutrients and caloric needs	1.2	1.4	0.38
Food composition	1.6	1.1	5.36*
Dietary practices	2.7	2.7	0.01

*Significant at <.05 level.

higher than the girls in age 17-18 group. This could be due to the increased exposure to nutritional information as the girls progress through years.

Mean Misconception Scores According to Education Level of Subject's Mother

The fourth hypothesis was:

H_4: There will be no association between the mean misconception scores of the respondents and education levels of mothers of the respondents.

The subjects were divided to three groups: the mothers with college degree or some college education, mothers with high school diploma, and mothers without college diplomas. Since 12 girls reported that they did not know their mothers education level, only 58 girls were included in the hypothesis testing. See Table XIX.

TABLE XIX

ANALYSIS OF VARIANCE FOR MISCONCEPTION SCORES ACCORDING TO MOTHERS EDUCATION LEVELS

N=58

Mean Score	High School n=19	With High School Diploma n=27	College Education n=12	F-Value
Misconception	5.1	5.1	5.8	0.74

P=<.05

The F-value obtained from analysis of variance showed that no significant association between misconception scores and mother's education levels, at <.05 level. Hypothesis 4 was not rejected.

The mean misconception scores of three categories by mothers' education levels were tested by analysis of variance. A significant difference was found at <.05 level. According to Duncan's Multiple Range Test, the misconception score was significantly higher for those subjects whose mothers had some college education compared to those who had less than high school education. See Table XX.

TABLE XX

ANALYSIS OF VARIANCE OF MISCONCEPTION SCORES OF THREE CATEGORIES ACCORDING MOTHERS' EDUCATION LEVELS

N=52

Categories	Misconception Scores			F-value
	High School n=19	With High School n-27	College Education n=12	
Role of nutrient and caloric needs	1.2	1.2	1.5	0.53
Food composition	0.9[a]*	1.3	1.7[a]	2.79
Dietary practices	2.9	2.6	2.7	0.24

*Means for score in a row of the table that have a common subscription are significant different from each other at <.05 level.

Responses of Nutritional Questions About Pregnancy

The last question of the first part of the questionnaire, "What nutritional questions do you have about pregnancy?" was responded to by 10 girls. The responses were in three categories:

A) Kinds of Foods

1. "What kind of food should I eat? Tell me about some good nutritious foods."
2. "Will not eating right affect the baby?"
3. "What do you have to eat to make a healthy baby?"
4. "What kind of food should I eat? What would be better for me?
5. "What is a healthy diet for a baby during pregnancy? Why?

B) Amounts of Foods

6. "How many calories should you take a day?"
7. "How much milk should I take? How important?
8. "How many fruits should I eat?"

C) Over-weight Problem

9. "Am I going to stay this fat forever?"
10. "I am over-weight (gained 30 pounds), would it hurt my baby to eat less and try to lose weight?"

CHAPTER V

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of the study was to determine perinatal nutrition misconceptions of pregnant adolescents age 18 or under in the northeastern Oklahoma. A study of prevalent misconceptions among pregnant adolescents will help to formulate suggestions and recommendations for nutrition programs to assist pregnant adolescents to meet their nutritional needs.

The objectives in this study were as follows:

1. To identify background information, such as, race, place of residency, enrollment in Home Economics classes, sources of nutrition information, medical problems during pregnancy, and month of initial prenatal care.

2. To identify perinatal nutrition misconceptions of pregnant adolescents in Oklahoma.

3. To determine any association between mean misconception scores of the respondents and each of the following: the number of pregnancies, trimester of pregnancy, age, and mother's educational level.

4. To make suggestions and recommendations for nutrition education programs to assist pregnant adolescents to meet their nutritional needs.

During the months of June and September, 1983, 70 pregnant

adolescents who were participants in Claremore Indian Hospital, Washington County Health Unit and Margaret Hudson Program constituted the sample for this study. Perinatal nutrition questionnaires were administered among these girls. Participants in responding questionnaires were based on their willingness to participate in the study.

Twenty-seven participants (39%) were black, 25(35%) were white, and 18 (26%) were other ethnic groups (16 Indian, and 2 Hispanic). The majority, 43 (63%), of the participants lived in a city with population of 10,000 or more. The remaining participants (37%) lived in town with population 2,500 to 10,000 or in rural area with population fewer than 2,500.

The responses ranged in age from 13 to 18 years. The largest percentage of the participants, 40 (56%) of the subjects were in the 17 and 18 year old group. Thirty (44%) were under 17 years old. This age group was determined by Committee of Maternal Nutrition, National Research Council to be at biological and psychological risk.

Forty-nine (70%) respondents completed 10th grade or above, and 21 girls (30%) had finished 9th grade, and 7 (10%) had finished 8th grade or even less. Over one-half (55%) of the respondents' mothers had at least high school diplomas. Five (7%) mothers had college degrees, 7 (10%) mothers had some college education, and 27 (38%) mothers finished high schools. The remaining mothers, 10 (28%) did not complete high schools.

In regarding to the information about pregnancy, 61 (87%) respondents were in the first pregnancy. The remaining respondents, 9 (12%) were in second or third pregnancy. Approximately 72 percent of

the respondents in the study were found to be in the second and third trimester of pregnancy. Nineteen (28%) of the respondents were in the first trimester at the time of study.

It was found that 65 of the 70 pregnant adolescents (93%) were receiving prenatal care from a physician. Over one-half (63%) of the respondents started visiting physicians during the first trimester. About one-fourth (23%) of the girls were in second trimester. Five respondents (7%) delayed their prenatal care during third trimester, at the seventh month.

The non-dietary practices of respondents were also obtained in this study. Eight (11%) of the girls reported that they had pica practices: six girls used starch, one girl used clay, and one girl used dirt.

Approximately one out of six respondents, 12 (17%) consumed alcohol during pregnancy. No one drank alcohol beverages every day, all of the reported subjects consumed alcohol on an infrequent basis. Almost every girl, 69 (99%) reported that they drank carbonated beverages during pregnancy. About one-fifth of the respondents, 15 (21%) drank three bottles or more a day. Nearly one-third of the respondents, 32 (46%) drank 1-2 bottles a day. One-third of the respondents, 22 (31%), drank less than one bottle a day. A very low percentage of respondents in this study drank coffee, 9 girls (12%) drank less than one cup a day, and 6 (8%) drank 1-2 cups a day.

To determine the prevalence of nutrition misconceptions, the responses of 30 nutrition statements from 70 pregnant adolescents were analyzed by frequency and percentage. Nearly all of the girls (98%) reported that smoking and drinking were likely to affect the health of

the baby. However, about three-fourths of the girls (73%) believed that too much coffee during pregnancy could be harmful to baby. The conclusions about the effects of caffeine on the outcome of human pregnancy are not established.

Although, the majority of the girls (93%) were aware that eating a variety of foods from basic 4 was the best way to get all the nutrient during pregnancy, over three-fourths (77%) of the girls still believed that one vitamin pill a day was a way to remain in good health during pregnancy.

Seventy percent of the subjects knew the food sources and functions of calcium. But, 30 percent of the girls did not know that 5 to 6 glasses of milk a day should be included during pregnancy.

About three-fourths (74%) of the subjects recognized that the proper weight gain during pregnancy was 25-30 pounds. And, 65 percent of the girls knew that too much or too little weight gain were not appropriate for mother and baby. However, over three-fourths (77%) of the girls did not know that a daily increase of 300 calories was recommended during pregnancy.

It was the intent of this study to test the following hypotheses:

H_1: There will be no association between the mean misconception scores of the respondents and the number of pregnancies.

H_2: There will be no association between the mean misconception scores of the respondents and the trimester of pregnancy.

H_3: There will be no association between the mean misconception scores of the respondents and age of respondents.

H_4: There will be no association between the mean misconception scores and education levels of mothers of the respondents.

For hypothesis 1, analysis of variance indicated a significant association at <.05 level between the nutrition knowledge of primigravida and non-primigravida group. Hypothesis 1 was rejected. According to Duncan's Multiple Range Test, those who were pregnant for the first time had significantly less misconceptions than those who were pregnant for the second or third time.

Hypothesis 2, analysis of variance showed no significant association between misconception scores and the trimester of pregnancy, at <.05 level. Hypotheses 2 was not rejected.

Hypothesis 3, analysis of variance indicated that no significant association between misconception scores and age of the respondents. Hypothesis 3 was not rejected.

Hypothesis 4, analysis of variance indicated that no significant association between misconception scores according to mother's education level, at <.05 level. Hypothesis 4 was not rejected.

The mean misconception scores in the categories, role of nutrients and caloric needs during pregnancy were related to the trimester of pregnancy. The scores of girls in their third trimester of pregnancy was significantly higher than the score for those in the second trimester.

The misconception scores in the category of food composition was related to respondents' age and respondents' mothers' education levels. The older group (age 17 or older) had less misconceptions than the younger group (age 16 or younger) in the category of food composition. And, also, mothers with less than high school education had less misconceptions in the area of food composition than mothers with some college education or with college degree.

The misconception score of category of dietary practices during pregnancy was related to the number of pregnancies. The primigravida group had significantly less misconceptions than non-primigravida group. All of these findings indicated that the importance of nutrition education for the pregnant teenagers.

Recommendations for Nutrition Education Programs

Based upon the findings from this study and the review of the literature, the following suggestions are made for nutrition program designed to develop nutrition education components for pregnant adolescents:

1. To reinforce the importance of eating variety of foods is the best way to get all the nutrients during pregnancy.

2. To stress the importance of good nutrition, before, during, after pregnancy to the health of the baby.

3. To assure the importance of following a proper diet is as important as taking nutrient supplement.

4. To emphasize the detrimental effects of smoking and drinking during pregnancy to the health of the baby.

5. To stress the fundamental nutrition education about food composition of basic four group.

6. To include the knowledge about quantities of each four food groups needed during pregnancy.

7. To include the knowledge about craving may indicate that hormonals change in body, not what mother lacks in the diet.

8. To emphasize the health hazardous effects of certain pica

practices during pregnancy.

9. To emphasize the importance of decreasing the amount of soft drink consumptions.

Recommendations for Overall Nutrition Education program:

1. To provide nutrition education to the parents of the pregnant adolescents.

2. To develop a team of professionals for teaching nutrition to pregnant adolescents.

3. To develop a program in educating the very young age group in prevention of pregnancy, as well as nutrition intervention during pregnancy.

4. To provide in-service training for nutrition educators in the programs for pregnant adolescents.

5. To plan nutrition education programs to combat perinatal misconceptions held by the non-primigravida group.

Recommendations for Further Study

The researcher made the following recommendations for further research:

1. This study was conducted with a limited number of participants in northeastern Oklahoma programs. Further studies are needed in a larger number of participants for comparison of results.

2. To determine perinatal misconceptions of parents of pregnant adolescents to provide information for nutrition education programs designed for pregnant adolescents

3. To evaluate the relationship of nutrition misconceptions and

nutritional status of infants born to pregnant adolescents.

4. To assess the relationship of the dietary intake of pregnant adolescents and their nutrition misconceptions.

5. To determine the differences in nutrition misconception scores of pregnant adolescents in different ethnic groups and their mother's education levels.

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APPENDIXES

APPENDIX A

PERINATAL NUTRITION QUESTIONNAIRE

Part I

DIRECTIONS: Please answer each question by marking "√" in the blank by the answer that is correct for you.

1. What is the highest grade you have completed?

____12th grade	____9th grade	____6th grade
____11th grade	____8th grade	____5th grade
____10th grade	____7th grade	____4th grade

2. When were you born?

_____
date/ month/ year

3. How many years of school has your mother completed?

____less than 6 years	____finished high school
____6-8 years	____ some college education
____9-11 years	____ college degree

4. In what size city or town are you living?

____city, more than 50,000
____city, less than 50,000
____town, less than 10,000
____town, less than 2,500
____rural

5. This is my ____first pregnancy
____second pregnancy
____third pregnancy

6. This is my

____2nd	____5th	____8th
____3rd	____6th	____9th month of pregnancy
____4th	____7th	

7. Have you been to a doctor about your pregnancy?
____yes, ____no. (If no, go to Question 9)

8. In what month of pregnancy did you first go to a doctor?

____2nd month	____5th month	____8th month
____3rd month	____6th month	____9th month
____4th month	____7th month	

9. What is your racial origin?

____Black	____Hispanic
____Native American Indian	____White (not Hispanic)
____Asian	____other

10. Do you smoke?
____often
____sometimes
____never (if you never smoke, go to question 12)

11. How many cigarettes do you smoke a day?
____less than 1 pack ____3-4 packs
____1-2 packs ____more than 4 packs

12. Do you drink alcoholic beverages such as beer, wine, and liquor?
____yes, ____no (if no, go to question 14)

13. How often do you drink alcoholic beverages?
____every day
____at least once a week, but not every day
____at least once a month, but less than once a week
____more than once a year, but less than once a month

14. Do you drink any carbonated beverages, such as Coke, Dr. Pepper, Seven-Up, Diet colas?
____often
____sometimes
____never (if you never drink carbonated beverages, go to Question 16)

15. How many carbonated beverages do you drink in a day?
____less than 1 bottle or can
____1-2 bottles or cans
____3-4 bottles or cans
____more than 4 bottles or cans

16. Do you drink coffee?
____often
____sometimes
____never (if you never drink coffee, go to Question 18)

17. How many cups of coffee do you drink a day?
____less than 1 cup ____3-4 cups ____5-6 cups
____1-2 cups ____4-5 cups ____more than 6 cups

18. Have you had any class in Home Economics?
____yes, ____no (if no, go to question 20)

19. When did you have a class in Home Economics?
____4th-6th grade ____9th grade ____12th grade
____7th grade ____10th grade
____8th grade ____11th grade

20. Do you have any of the following problems during pregnancy? Please check (√) all that apply.
____high blood pressure
____headaches
____vomiting
____diarrhea
____constipation
____other

21. Are you eating any of the following? Check (√) all that apply.
____clay ____paint
____starch ____paste
____detergent ____other. What?_____

22. What are your sources of nutrition information? Check (√) all that apply.
____parents
____grandparents
____relatives other than parents, grandparents
____county extension Home Economist
____hospital dietitian
____nurse
____doctor
____Home Economics teacher
____friends
____neighbors
____library books
____pamphlets in doctor's office or clinics
____magazines
____newspaper
____others. (Specify)_____

23. What nutritional question do you have about pregnancy?

_____

Part II

DIRECTIONS: Read each statement carefully. If you believe the statement is true, circle T. If you believe the statement is false, circle F. If you do not know, circle DK.

T= True F=False DK=Don't know

Example:

(T) F DK Good eating habits during pregnancy are very important to the health of baby.

Questions:

T F DK 1. Eating a variety of foods from the basic 4 each day is the best way to get all the nutrients during pregnancy.

T F DK 2. "Eating for two" is the best way to be sure of a healthy baby.

T F DK 3. Generally, food that is good for you also is good for your baby.

T F DK 4. During pregnancy, normal weight gain should be between 25-30 pounds.

T F DK 5. A daily increase of 300 calories is recommended during pregnancy.

T F DK 6. Five to six glasses of milk a day should be included in a diet during pregnancy.

T F DK 7. To provide extra calories during pregnancy, mother should eat candy or cookies daily.

T F DK 8. One egg a day is recommended during pregnancy.

T F DK 9. An increase of iron intake in mother's diet is to build up baby's iron store before birth.

T F DK 10. The needs for extra intake of calcium, phosphorous, vitamin D are for baby's teeth and bones development.

T F DK 11. Calories only come from foods.

T F DK 12. Cheese, puddings and ice cream contribute calcium to your day's needs.

T F DK 13. The food from meat group can build up and repair mother's and baby's cells tissues.

T F DK 14. The main function of bread and cereals are to develop baby's skin and hair.

T F DK 15. Green leafy vegetables do not contain any nutrients for baby's needs during pregnancy.

T F DK 16. Potato chips are a snack rich in iron.

T F DK 17. Carbonated beverages provide many kinds of minerals.

T F DK 18. Fiber is supplied by fruits, vegetables and whole grain cereals.

T F DK 19. Fruit juices contain more vitamin C than fresh fruits.

T F DK 20. Canned vegetables contain more salt than frozen or fresh vegetables.

T F DK 21. Too much salt intake can cause water retention in the body during pregnancy.

T F DK 22. One vitamin pill a day is a way to remain in good health during pregnancy.

T F DK 23. Craving indicates what mother lacks in her diet.

T F DK 24. During pregnancy, following a proper diet is as important as taking nutrient supplement prescribed by a doctor.

T F DK 25. Too much weight gain can contribute to problems such as high blood pressure and swelling of hands and feet.

T F DK 26. Too little weight gain during pregnancy can mean a small, underweight baby.

T F DK 27. It does not matter what the mother eats or drinks because the baby will be born the way it was meant to be born.

T F DK 28. Smoking and drinking during the pregnancy are likely to affect the health of the baby.

T F DK 29. Too much coffee during pregnancy can be harmful to baby.

T F DK 30. Good nutrition before pregnancy will affect the health of the baby.

APPENDIX B

LETTERS OF PERMISSIONS IN OBTAINING DATA

April 28, 1983

Miss Janet C. Wang
Department of F. N. &
Institution Administration
Oklahoma State University
Stillwater, OK 74078

Dear Miss Wang:

We shall be happy to help you with your study in any way we can.

The areas you wish to cover are in the Claremore and Pawnee Service Units. Since both Services Units have Nutritionists in charge, I shall ask you to write to them directly.

Mrs. Helene Morgan, M.S., R.D.
Service Unit Nutritionist
Claremore Indian Hospital
Claremore, OK 74017
Tel: 918/735-2011

Miss Ruth Ritter, M.S., R.D.
Service Unit Nutritionist
White Eagle Indian Helath Center
P. O. Box 5 - White Eagle
Ponca City, OK 74601
Tel: 405/765-2501

The Claremore Service Unit includes several health centers, but none in Tulsa. The Pawnee Service Unit has three health centers: White Eagle, Pawnee and Pawhuska.

Please contact the respective Nutritionists directly. They will be happy to help you.

Best wishes for success in your study.

Sincerely yours,

Ruth Hembekides

Ruth Hembekides, M.S., M.P.H., R.D.
Chief, Nutrition Branch
Oklahoma City Area Indian Health Service

June 6, 1983

Ms. Janet Wang
1233 Brookside Parkway
Bartlesville, OK 74003

Dear Ms. Wang:

The Research Review Committee has approved your research proposal on nutrition beliefs of pregnant adolescents. You will, of course, need to contact Mrs. Nancy Pate, director of the Margaret Hudson program, to secure her approval.

Please work with the Margaret Hudson staff to insure that no one will be able to identify a particular questionnaire with a particular student.

Good luck in your work!

Sincerely,

Jerry Roger, Administrative Assistant
Instructional Support Services

JR:bjb

cc: Mrs. Nancy Pate
Dr. Bernice Kopel
Research Review Committee

APPENDIX C

KEY FOR SCORING QUESTIONNAIRE

BY CATEGORIES

KEY FOR SCORING QUESTIONNAIRE BY CATEGORIES

Role of nutrients and caloric needs

1. T
2. F
3. T
4. T
4. T
5. T
6. T
7. F
8. T
9. T
10. T

Food Composition

11. F
12. T
13. T
14. F
15. F
16. F
17. F
18. T
19. F
20. T

Dietary practices during pregnancy

21. T
22. F
23. F
24. T
25. T
26. T
27. F
28. T
29. T
30. T

APPENDIX D

FREQUENCY AND PERCENTAGE OF THE ANSWERS OF 30-ITEMS NUTRITION STATEMENTS

TABLE XXI

FREQUENCY AND PERCENTAGE OF THE ANSWERS OF 30-ITEMS NUTRITION STATEMENTS

Item. No.	Correct Answer		Wrong Answer		Don't Know	
	N	%	N	%	N	%
1.	65	92.9	1	1.4	4	5.7
2.	33	47.1*	26	37.1	11	15.7
3.	53	75.7	12	17.1	5	7.1
4.	52	74.3	7	10.0	11	15.7
5.	6	8.6	10	14.3	54	77.1
6.	39	55.7	21	30.0	10	14.3
7.	64	91.4	1	1.4	5	7.1
8.	28	40.0	8	11.4	34	48.6
9.	47	67.1	5	7.1	18	25.7
10.	51	72.9	1	1.4	18	25.7
11.	23	32.9	33	47.1	14	20.0
12.	47	67.1	5	7.1	18	25.7
13.	44	62.9			26	37.1
14.	13	18.6	16	22.9	41	58.5
15.	55	78.6	5	7.1	10	14.3
16.	45	64.3	9	12.9	16	22.9
17.	39	55.7	4	5.7	27	38.6
18.	53	75.7	1	1.4	16	22.9
19.	37	52.9	13	18.6	20	28.5
20.	42	60.0	6	8.6	22	31.4
21.	51	72.9	4	5.7	15	21.4

Item No.	Correct Answer N	%	Wrong Answer N	%	Don't Know N	%
22.	10	14.2	54	77.1	6	8.6
23.	28	40.0	23	32.9	19	27.1
24.	56	80.0	4	5.7	10	14.3
25.	46	65.7	6	8.6	18	25.7
26.	44	62.9	14	20.0	12	17.1
27.	63	90.0	4	5.7	3	4.3
28.	69	98.6	1	1.4		
29.	3	4.2	51	72.9	16	22.9
30.	34	48.6	29	41.4	7	10.0

*Does not equal 100%, due to rounding.

VITA 2

Janet Chun-Yee Pan Wang

Candidate for the Degree of

Master of Science

Thesis: PERINATAL NUTRITIONAL MISCONCEPTIONS AMONG PREGNANT ADOLESCENTS IN NORTHEASTERN OKLAHOMA

Major Field: Food, Nutrition and Institution Administration

Biographical:

Personal Data: Born in Taipei, Taiwan, Republic of China, September 16, 1952, the daughter of Mr. and Mrs. Hsi-Ching Pan.

Education: B.S. in Psychology, June, 1974, Chun-Yuan Christian University, Taiwan. B.S. in Dietetics, December, 1978, University of Maryland. Completed requirements for the Master of Science degree at Oklahoma State University in May, 1984.

Professional Experience: Consulting Dietition assigned by Shamrock Stem, Inc. at Virginia Mennonite Home and Sunnyside Presbyterian Home, Harrisonburg, Va. from 1979 to 1980. Dietary Supervisor and dining room manager, Hermitage Nursing Home, Alexandria, Va. 1978.

Professional Honor: Phi Upsilon Omicron, Oklahoma State University, Dean' List of Human Ecology College, University of Maryland.

Professional Organizations: American Dietetic Association, Oklahoma Dietetic Association, American Home Economic Association and Oklahoma Home Economic Association.