



Montana State University student nutritional needs assessment
by Pamela Rothrock Harris

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in
Home Economics

Montana State University

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Abstract:

This study determined the proportion of college students with nutritional health care needs from a sample of (N=2941) Montana State University students being treated at the Swingle Student Health Center and dental clinic during three weeks of the spring quarter. This is the first study to report the frequency of medical problems with a nutritional component among college students according to the literature surveyed.

All students treated at the Health Center were coded for age, sex, social security number, diagnosis, and therapy received. Of the N=2941 appointments, 5.4 percent of all appointments were seen for health problems with a nutritional component. The clinical subgroups ranked in order of frequency were weight problem, dental disorders, cardiovascular disorders, eating disorders, gastrointestinal disorders, endocrine disorders, pregnancy, anemia and food allergies.

Cardiovascular disorder's were the only clinical subgroup that increased with age. The health problems that were more prevalent in females were overweight, periodontal disease, bulimia, pregnancy, anemia, ulcers, anorexia nervosa and diabetes. Males were treated more frequently for hypertension, excessive dental, decay, hypercholesterolemia and hypertriglyceridemia.

During the three week study period, 23 percent of the females and 14.4 percent of the males enrolled at MSU used the services at the Health Center or dental clinic. This was 18.2 percent of the total enrollment. The mean number of appointments per student was 1.58.

It was concluded that nutritional health problems do occur among college-aged students and the nutrition services at this college health center are inadequate.

MONTANA STATE UNIVERSITY STUDENT

NUTRITIONAL NEEDS ASSESSMENT

by

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A thesis submitted in partial fulfillment
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of

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MONTANA STATE UNIVERSITY
Bozeman, Montana

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of a thesis submitted by

Pamela Rothrock Harris

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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Date June 12, 1984

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ABSTRACT

This study determined the proportion of college students with nutritional health care needs from a sample of (N=2941) Montana State University students being treated at the Swingle Student Health Center and dental clinic during three weeks of the spring quarter. This is the first study to report the frequency of medical problems with a nutritional component among college students according to the literature surveyed.

All students treated at the Health Center were coded for age, sex, social security number, diagnosis, and therapy received. Of the N=2941 appointments, 5.4 percent of all appointments were seen for health problems with a nutritional component. The clinical subgroups ranked in order of frequency were weight problems, dental disorders, cardiovascular disorders, eating disorders, gastrointestinal disorders, endocrine disorders, pregnancy, anemia and food allergies.

Cardiovascular disorders were the only clinical subgroup that increased with age. The health problems that were more prevalent in females were overweight, periodontal disease, bulimia, pregnancy, anemia, ulcers, anorexia nervosa and diabetes. Males were treated more frequently for hypertension, excessive dental decay, hypercholesterolemia and hypertriglyceridemia.

During the three week study period, 23 percent of the females and 14.4 percent of the males enrolled at MSU used the services at the Health Center or dental clinic. This was 18.2 percent of the total enrollment. The mean number of appointments per student was 1.58.

It was concluded that nutritional health problems do occur among college-aged students and the nutrition services at this college health center are inadequate.

INTRODUCTION AND STATEMENT OF PROBLEM

Student health services are designed to evaluate and treat many health problems by providing acute medical care, counseling services, and some preventive care. All students enrolled at Montana State University have access to Swingle Student Health Center.

During spring quarter of 1983, two staff members, Patsy Bryan, R.N. and Robert McKensie, M.D. from the Swingle Student Health Center approached the nutrition faculty in the Department of Home Economics about the possibility of providing nutritional therapy in the health center for Montana State University students. They inquired if this service could be provided by a supervised graduate student. In the past, doctors and nurses have provided some nutritional consultation to students, but due to the time and cost effectiveness this has been limited. It is possible that many clients who would have benefited from nutritional health care planning went without treatment because of the unavailability of this professional service.

Dr. McKensie stated that there seems to be an increase in the number of students with overweight; elevated triglycerides, cholesterol and high blood pressure. The foods and nutrition faculty recommended that a study be conducted to assess the proportion of students with major medical problems requiring nutritional therapy.

In the meantime, the medical staff at the Health Center informally collected data for a five day period during autumn quarter 1983 to determine the number of students needing nutritional therapy.

Forty-five patients were identified by the doctors and nurses. Based on this informal pilot study, the health center hired a registered dietitian starting winter quarter 1984 for four to eight hours weekly. At this time, it was not known if this limited service would be adequate. The data did not identify the frequency or the types of major health problems of college students requiring nutritional therapy and given the short period of data collection may not represent the full extent of need for nutritional therapy.

Early recognition and treatment of nutritional problems could have the following positive effects: increased student class attendance, improved academic performance and possibly increased numbers of students completing their degree requirements. Thus, both the students and health care planners could benefit from a nutritional needs assessment of college students. The students' health care planning could be more comprehensive and would better meet their health needs. The university health care planners would be able to utilize the study's findings to up-date information and assist in health care planning.

Statement of the Problem

The purpose of this study was to determine the proportion of patients with nutritional health care needs from a sample of Montana State University students being served at the Swingle Student Health Center and dental clinic during a three week period in April, 1984. The second purpose was to obtain a rank-ordered frequency table of the most common health problems with a nutritional component seen in a

college clientele. This is the first study to report the frequency of medical problems with a nutritional component among college students according to the literature surveyed.

Objectives

Overall objectives of this study included:

- (1) To provide data for improvement of the health care environment for Montana State University students through the services at the Swingle Student Health Center by:
 - (a) identifying the clients that need nutritional therapy,
 - (b) identifying the major health problems that have a nutritional component,
 - (c) providing recommendations for meeting the clients' nutritional health care needs.

Limitations

There were four major limitations to this study:

- (1) sample size represented only 18 per cent (N=1862) of total student enrollment at MSU.
- (2) sample represented only those students using the Student Health Center on MSU campus during those specific three weeks in April.
- (3) sample represented only students using Swingle Health Center on campus, not off campus medical care.

- (4) spring quarter students that were surveyed may not have represented students' nutritional health care needs at other times during the year.

Basic Assumptions

For the purposes of this study it was assumed that a survey of 1862 clients would be sufficient to establish the proportion of patients with nutritional health care needs.

Definition of Terms

For the purposes of this study the following terms have been defined:

- (1) Registered Dietitian - professional who is a member of the American Dietetic Association who has completed a predietetic bachelor degree, qualifying experience and passed the dietetic registration examination.
- (2) Anemia - represents last stage in progression of iron depletion. Iron storage becomes exhausted and if iron consumed and absorbed does not compensate for iron lost from the body, the hemoglobin concentration begins to decrease.
- (3) Bulimia - binge eating followed by evacuation techniques of self-induced vomiting or laxative abuse.
- (4) Anorexia Nervosa - self-starvation syndrome characterized by severe emaciation and morbid fear of gaining weight.
- (5) Periodontal Disease - inflammation or degenerative, or both of dental connective tissue, alveolar bone and tooth cementum

characterized by loosening of teeth, resorption of alveolar bone and recession of the gingivae.

(6) Pregnancy Gingivitis - inflammation of gingival tissue characterized by congested, red and swollen gingival which are usually painless and tend to bleed easily on pressure.

(7) Necrotizing Ulcerative Gingivitis (trenchmouth) - noncommunicable, inflammatory disease of gingiva, oral mucous, pharynx or tonsils characterized by redness, swelling, ulceration, bleeding and pain.

(8) Crohn's Disease - chronic inflammation of the lower ileum, but may involve other segments of intestine which alter nutrient absorption.

(9) Ulcerative Colitis - chronic inflammatory and ulcerative disease of colon and rectum, characterized by passage of bloody mucus, diarrhea and pain.

(10) Gastritis - inflammation of gastric mucosa causing a feeling of fullness, anorexia, nausea, vomiting and epigastric pain.

REVIEW OF LITERATURE

Historical Perspective

It is generally acknowledged throughout the literature that some nutritional health problems do occur in the college-aged population. The extent of these health problems, however, is debatable. Nutritional therapy is a relatively new development in college health centers and the outcome literature on its effectiveness is still unavailable.

Literature searches were conducted covering the last ten years in the Nutrition Abstracts and Reviews and two computerized literature search programs: Medline and Health. Robert W. Martin, M.D., Acting Director, West Virginia University Student Health Center was contacted in regards to similar studies being administered by other college health centers. He reported that he was not involved in any such study or aware of any other facility collecting this data.

During the last fifteen years, nutrition therapy programs have been primarily aimed at high risk populations such as infants, pregnant women, low-income individuals and the elderly. A small number of researchers have attempted to evaluate the nutritional status of college students, ranging from hematological characteristics and anthropometric measurements to daily nutrient intakes and food preferences (Aljadir et al., 1981; Bootman and Wertheimer, 1980; Driskell et al., 1979; Einstein et al., 1970; Jakobovits et al., 1977; Khan and Lipke, 1982; Ostrom and Labuza, 1977; Parham and Parham, 1980;

Schuck, 1961; Stasch et al., 1970; Wein and Wilcox, 1972; Young et al., 1957). The literature contained limited references regarding the major health problems of college students that require nutritional therapy.

Body Weight

Height and Weight

The literature dealing with the mean heights and weights of college aged students is summarized in Tables 1 and 2. Driskell et al. (1979) reported while mean height for college males was similar to that reported by Ostrom et al. (1977) and the Ten-State Survey (1972), his subjects were heavier. The females were slightly taller in both Driskell et al. (1979) and Ostrom et al. (1977) studies as compared to the Ten-State Survey (1972). The Ten-State Survey (1972) mainly assessed low income families, which may not be representative of college-aged population. The mean weight for 275 college females (Ostrom et al., 1977) was five to nine pounds less than those reported by Driskell et al. (1979) and the Ten-State Survey (1972).

Table 1. Literature Summary:
Mean heights and weights of college aged males.

Investigator(s)	Sample Size	Age	Height in.	Height cm.	Weight lb.	Weight kg.
Driskell et al., (1979)	50	21.0*1.1	70.6	179.4*6.6	165.9	75.4*9.2
Ostrom et al., (1977)	90	21.4	70.0		160.0	
Ten-State Survey (1972)	479	21.0			158.2	71.9
	482	21.0	70.8	175.7		

* = Plus or minus.

Table 2. Literature Summary:

Mean heights and weights of college aged females.

Investigator(s)	Sample Size	Age	Height in.	Height cm.	Weight lb.	Weight kg.
Driskell et al., (1979)	53	21.5*1.1	64.6	164.2*7.4	128.5	58.4*7.1
	47+	20.2*1.0		168.5*9.6	132	60.0*7.3
Ostrom et al., (1977)	275	20.5	65		123	
Ten-State Survey (1972)	866	21			130.5	59.3
	855	21	63.7	161.8		

* = Plus or minus.

+ = Using oral contraception.

Obesity

There is no current estimate representative of the general United States population for the prevalence of adult obesity. The data available is taken from selected segments of the population and special study groups (Ten-State, 1972; HANES, 1975). Depending on the definition used, as much as 30 percent of the adult population of the United States are considered to be obese. There are no universally accepted definitions of overweight or obesity; their precise meanings are poorly defined. Overweight is frequently defined as a body weight from 10 to 20 percent higher than ideal weight for height. On the basis of body weight, obesity is defined as body weight 25 percent or more above desirable levels.

In obese persons, mortality and morbidity are increased in heart disease, cerebrovascular accidents, cancer, diabetes mellitus, renal disease, gallstone disease, some respiratory diseases, osteoarthritis, endometrial carcinoma, and some skin disorders (Zeman, 1983).

Wein and Wilcox (1972) reported that 16 percent of N=44 females ages 19 to 22 years were considered obese. This was less than the HANES (1975) and the Ten-State Survey (1972) which were 18.9 percent and 16.6 percent, respectively. Seventeen percent of N=42 males ages 19 to 22 years were reported to be obese which was greater than both percentages from the HANES (1975) and Ten-State Survey (1972). Wein and Wilcox (1972) did not define obesity or anthropometric criteria used to determine the percent of obesity in their study. To estimate the prevalence of obesity in the United States, the HANES (1975) and the Ten-State Survey (1972) both defined adult obesity as tricep fatfold greater than 85th percentile of measurements. According to the Ten-State Survey (1972), these measurements for men would be greater than 18.6 mm and for women greater than 25.1 mm. The percentage of obesity in college-aged population literature reviewed is summarized in Table 3.

Cardiovascular

There is a high correlation between increased serum lipid concentration, especially cholesterol, and the incidence of certain forms of cardiovascular disease. Lipids in high concentrations will deposit in arterial walls, promoting arteriosclerosis and its various consequences. Epidemiological studies have indicated a high degree of association between increased serum cholesterol levels and increased incidence of cardiovascular disease.

The three most important risk factors for development of

Table 3. Literature Summary:
Percent obese by age and sex for college aged persons

Investigator(s)	Measurements	Sample Size	Sex	Age	Percent Obese
Wein & Wilcox (1972)	Weight?	42	M	19-22	17
	Weight?	44	F	19-22	16
	Weight?	86	M/F	19-22	16
HANES (1975)	Tricep*		M	20-44	16
	Tricep*		F	20-44	18.9
Ten-State Survey (1972)	Tricep+	478	M	21	15.1
	Tricep+	837	F	21	16.6

? Undefined anthropometric measurements.

* Obesity defined as triceps greater than 85th percentile.

+ Obesity defined as triceps greater than 18.6 mm. males and greater than 25.1 mm. females.

arteriosclerosis as indicated by epidemiologic studies are hypertension, hypercholesterolemia, and cigarette smoking (Zeman, 1983). Other risk factors include obesity, lack of physical activity, diabetes mellitus, hypertriglyceridemia, and a family history of the disease, indicating a genetic predisposition. The studies on coronary artery disease and blood pressure may be viewed as attempts to understand the etiology and life history of diseases important to the adult population and to the college-aged population in time.

In adulthood, serum cholesterol levels appear to increase with age. Wein and Wilcox (1972) studied serum cholesterol values for eighty-six individuals during a thirteen-year study. Twenty-two to thirty-eight percent of the eighty-six subjects had values of 200 mg. per 100 ml. or higher. The occurrence of such high values was

greatest (38 percent) from ages 19 to 22 years.

At ages 19 to 22, 36 percent of the subjects had two or more factors known to increase the risk of heart attack. Risk factors were: a serum cholesterol level of 200 mg. or more per 100 ml.; obesity; a diet relatively high in animal fat; inadequate physical activity; subjective feeling of tension; regular smoking; heredity, and diabetes.

Baghurst et al. (1980) surveyed 350 Australian college freshman, observing elevated plasma cholesterol, triglycerides and blood pressure. The elevated lipids related positively to the total intake of energy and fat in the students' diets. Females had slightly higher mean plasma cholesterol than males, but the mean triglyceride for males was higher than that of females (Baghurst et al., 1980). Systolic blood pressure was higher in males than in females but there were no differences in diastolic blood pressure. Seventeen percent of males and 2 percent of females had systolic blood pressure greater than 140 mm, and 2 percent of males and 1 percent of females had diastolic blood pressure greater than 90 mm. The average age of the subjects in the Baghurst et al. (1980) study was 18 years, with a range of 17-30.

The higher values for triglyceride and blood pressure in males were related to weight, since 13 percent of males were more than 20 percent overweight compared with only 5 percent of females (Baghurst et al., 1980).

Another foreign study (Demko et al., 1982) conducted on 1640 Russian students ages seventeen to twenty-six reported that cardiovascular disorders were one of the most frequent disorders observed. This disorder was more frequent in women and the incidence increased

with age. In contrast, cardiovascular disorders in the United States seem to be more frequent in men, but also increase with age.

Dental Disorders

Many dental diseases can occur in individuals who are otherwise in good health. Painful gingival tissues and teeth may decrease a patient's chewing and swallowing thus contributing to impaired digestion and nutritional deficiency.

Dental decay is the most prevalent chronic disease in the United States and occurs among all populations throughout the world. Caine (1976) reported the incidence of dental caries does not seem to be influenced by level of education. Dental caries have been reported to be present in 99 percent of adults by the age of 50. Pelton et al. (1969) reported that there are age and sex differences in caries levels. Older females have a higher caries level than males of the same age.

Necrotizing ulcerative gingivitis can cause the patient to suffer from severe anorexia. Food intake may be decreased because of pain, presenting a problem in nutritional care. An association seems to exist between necrotizing ulcerative gingivitis and psychologic and emotional stresses, such as those experienced by college students at examination times and during courtship difficulties. A complication factor during such periods is the frequency of grossly abnormal dietary habits (Goodhart and Shils, 1980).

Periodontal disease is considered a serious problem which has increased in prevalence in the United States. Although malnutrition

cannot initiate common inflammatory periodontal disease, it may either predispose the host to the disease process, or modify the progress of pre-existing lesions according to Oliver (1975). Russel and Ayers (1960) reported that the prevalence of periodontal disease is slightly higher in males of all ages than females. Caine (1976) reported that in a sample of 120 college students ranging in age from 17 to 35 years there seems to be an association between education and both periodontal disease and oral hygiene. As the education level of the college students increased their habits of oral hygiene improved and a decrease in periodontal disease was observed. According to the American Dental Association Survey of 1952, periodontal treatment was required by 9.5 percent of males and 9.7 percent of females aged fifteen and older reported by 4000 dentists (Pelton et al. 1969). It was estimated that one-tenth of all adults in the United States required periodontal treatment (ADA, 1952). Russell and Ayers (1960) and Caine (1976) both indicated that education levels are influencing factors in the incidence of periodontal disease.

Enlargement of the gingiva can be associated with the hormonal activity of pregnancy. It has local irritating factors contributing to its initiation. The disease occurs in about 5 percent of pregnant women (Colby et al., 1971),

Eating Disorders

The increasing incidence of anorexia nervosa and bulimia has been attributed to either society's strong belief in being thin and even

underweight or because the diseases are now more easily recognized (Gross, 1982).

Anorexia Nervosa

Anorexia nervosa is believed to have a prevalence rate of one percent in the United States population. This disease primarily affects females between the ages of 14 and 25. Only ten percent anorexia nervosa patients are males according to Bruch (1973). The patient's fear of becoming fat is a severe obsession and consuming an extra crumb can cause total panic and disorganization. These patients have distorted body images of feeling fat even when emaciated. Patients have used low carbohydrate or low fat diets, induced vomiting, laxatives, enemas or overexercising to lose weight (Gross, 1982). The results of several studies show a mortality rate between 15 to 20 percent caused by starvation, electrolyte imbalance, cardiac arrest or infectious diseases (Gross, 1982).

Bulimia

In 1980 the American Psychiatric Association included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) the diagnostic criteria for bulimia, thus recognizing this eating disorder as separate from anorexia nervosa and obesity. Whereas anorexia nervosa is considered rare in the United States population, bulimia has been found in increasing rates. Table 4 summarizes the literature dealing with the percent of college students experiencing symptoms of bulimia. Halmi et al. (1981) surveyed 355 college students to

Table 4. Literature Summary:
Percent of bulimic college students

Investigator(s)	Sample Size	Sex	Bulimic	Percent
Halmi et al., (1981)	355	M/F	46*	13
	210	F	40*	19
	145	M	6*	5
Carter & Eason (1983)	93	F	32	34

* Estimates figured from percentages.

determine the prevalence of bulimia within the normal college population. Thirteen percent (N=46) of the total males and females experienced all of the major symptoms of bulimia outlined in the DSM-III. This was 19 percent of the female and 5 percent of the male college student population (Halmi et al., 1981). Within the reported bulimic population 87 percent were females and 13 percent were males (Halmi et al., 1981).

Although self-induced vomiting may accompany other symptoms of bulimia, the results of Halmi et al. (1981) study suggested that self-induced vomiting is not a necessary symptom for diagnosis. A significant relationship between laxative use and self-induced vomiting was detected. These forms of behavior, termed purging, occurred in an average of ten percent of the students. Students who experienced symptoms of bulimia had histories of being overweight or charting in the upper portion of the normal weight range. No significant differences in weight history were noted between vomiters and non-vomiters (Halmi et al., 1981).

Carter and Eason (1983) surveyed a specific population of college

women belonging to social sororities, because of the emphasis placed on looking pretty and thin. The researchers identified a group of women who binge and then purge themselves by self-induced vomiting, but had not sought medical or psychological treatment for this behavior.

Of the ninety-three females surveyed, thirty-four percent (N=32) identified themselves as self-induced vomiters. Carter and Eason (1983) reported a 15 percent increase in the prevalence of bulimia in college students as compared to Halmi et al. (1981) results, but this may be attributed to the specific population surveyed and should not be overlooked.

Gastrointestinal Disorders

Gastrointestinal disorders can alter a patient's gastrointestinal motility, secretions, absorption and excretion; all of which have nutritional implications. These alterations which include inadequate nutrient intake, excessive losses, malabsorption and increased nutritional requirements can cause malnutrition.

Crohn's disease can occur at any age but is more common between the ages of 15 and 35 years (Zeman, 1983). Gluten enteropathy typically appears in infancy or in adults, primarily at ages 20-30. Ulcerative colitis demonstrates a bimodal distribution image at onset, the problems occurring between the ages of 10 and 30 and again between ages 50-60.

Although no literature, to date, has reported the frequency of gastrointestinal disorders in college students one has a strong feeling based on age of onset that these gastrointestinal disorders occur in

this population.

Diabetes Mellitus

The prevalence of diabetes mellitus in the United States is not known. It is estimated that approximately 0.4 percent of young adults are diabetic. At this time, it does not seem that anyone has reported the incidence of diabetes in the college-aged population.

Hematocrit and Hemoglobin Concentrations

Both the Ten State Nutrition Survey (Ten-State) conducted in 1968-1970 and the National Health and Nutrition Examination Survey (HANES) in 1971-1972 reported that iron deficiency anemia is still a major medical problem among all age groups in the United States today, including our young people. In those individuals who were found to have hemoglobin concentrations below selected values, determinations of serum iron and iron binding capacity were also made to document the extent of iron deficiency. Low levels of hemoglobin were associated with low levels of serum iron and serum transferrin saturation, and to a lesser extent, with low levels of serum and red blood cell folic acid. The evaluations of iron intake data in relation to hemoglobin levels showed a tendency for a lower hemoglobin level to be associated with lower dietary iron intakes. There also appeared to be a functional consequence of iron deficiency, as Gardner et al. (1977) have noted a considerable impairment of work performance in subjects with hemoglobin concentrations below 12 grams per 100 ml.

Driskell et al. (1979) studied 150 college students and observed

that 2-4 percent of these students had low hemoglobin values and 8-17 percent had low hematocrit values. The mean hemoglobin values for these college students were slightly higher than those reported in a longitudinal study by Wein and Wilcox (1972) and for whites in the Ten-State Survey (1972) and HANES (1975) survey.

Wein and Wilcox (1972) followed N=68 students during a thirteen year study period. At ages nineteen to twenty-two, the mean hemoglobin concentrations were 13 and 12 grams per 100 ml. blood for men and women, respectively. These levels were below those reported by Driskell et al. (1979). They attributed these low hemoglobin concentrations to poor quality diets. Literature citations dealing with the mean hemoglobin and hematocrit values of college students are summarized in Table 5.

Iron deficiency anemia has been documented as substantial nutritional problem for college-aged women in Iraq (Talebany, 1981) and

Table 5. Literature Summary:
Mean hemoglobin-hematocrit values of college students

Investigator(s)	Sample Size	Sex	Age	Hemoglobin gm./100 ml.	Hematocrit Percent
Krishnamurthy et al., (1976)	10	F	19-21	10.42*0.31	
Driskell et al., (1979)	50	M	19-22	16.70*1.30	45.8*4.9
	53	F	19-22	14.30*1.40	40.4*5.0
	47	F+	19-22	14.20*1.30	40.2*3.9
Wein & Wilcox, (1972)	42	M	19-22	13.00	
	44	F	19-22	12.00	

* = Plus or minus.

+ = Females using oral contraception.

Japan (Ishigahi, 1979). In a survey of ten students in India, Krishnamurthy et al. (1976) observed low mean hemoglobin concentrations of 10.42 grams per 100 ml. among college women. These are considered third world studies, which sometimes present validity problems when compared to similar studies completed in the United States. An additional weakness in Krishnamurthy et al. (1976) study, utilized samples from only ten subjects. One should, therefore, interpret these results cautiously.

Summary

Health care planners have little available data, resources or reference information regarding the major health problems that have nutritional implications for college students.

METHODS AND PROCEDURES

Sample Population

Data were collected on each college student served at the Swingle Student Health Center and dental clinic between the dates of April 2-6, 9-13 and 16-20, 1984. The staff members involved with data collection were the physicians, nurses, dental staff and a dietitian. A minimum of 2941 patient appointments were surveyed.

Procedures

All patients treated at the Swingle Student Health Center and dental clinic were coded for age, sex, social security number, diagnosis, therapy service received and professional providing the service. Figure 1 is the revised coding card that was completed by the staff member providing service to the client.

The diagnostic classification and coding sheet, presently being used by the Health Center was revised to include references of medical problems with a nutritional component (Appendix). Each diagnosis that was nutritionally related was assigned a specific subgroup for identification.

On March 30, 1984 the medical and dental staff members were oriented during an all staff meeting about the purpose of the study and the suggested methods of coding to provide consistency of data collection. Each staff member received a copy of the revised

Figure 1. Swingle Student Health Center coding card.

DR: _____	NAME: _____
APPT. TIME: _____	D/B: _____
	Ht.: _____
STUDENT HEALTH SERVICE	Wt.: _____
SOC. SEC. NO.: _____	SEX: _____ DATE: _____
DISPENSARY VISIT: MED _____ SURG _____	
TREATMENT CODES: _____	_____
_____	_____

diagnostic classification and coding sheet.

Data Analysis

All collected data was recorded onto flow sheets and subsequently entered into the Montana State University computer. This baseline data collection provided:

- (1) frequency distribution of all health problems.
- (2) ranked-ordered frequency table of major health problems with a nutritional component.
- (3) frequency distribution by age of all major health problems with a nutritional component.
- (4) frequency distribution by sex of all major health problems with a nutritional component.

- (5) the percent of Montana State University college students using the health center.
- (6) the mean number of clinic appointments per student.
- (7) the age distribution of all appointments.
- (8) the percent of patients seen by the Dietitian.

RESULTS AND DISCUSSION

Two of the objectives of this study were to identify clients that may need nutritional therapy and to identify the major health problems that have a nutritional component. This study of 2941 patient appointments was completed at the Swingle Student Health Center during the dates of April 2-6, 9-13, 16-20, 1984. Table 6 shows the distribution of all health problems according to the diagnostic classification for each student seen at the health and dental clinics. Over 50 percent (N=1534) of all appointments were seen for EENT (ears, eyes, nose, throat) problems, dental problems, musculo-skeletal problems or in the GYN clinic for a check-up or contraception.

This study revealed that 160 patient appointments for medical or dental problems had a nutritional component. The 160 patient appointments represented 5.4 percent of the total patient visits (Table 7). Table 7 identifies the number of nutritional problems separately in the medical and dental clinics. The medical clinic reported 4.9 percent (N=127) of the 2613 patient appointments and the dental clinic reported 10.1 percent (N=33) of 328 patient appointments to be nutritionally related.

Body Weight

The medical and dental problems with a nutritional component are ranked in order of frequency and according to sex in Table 8. Students

Table 6. Distribution of all health problems according to diagnostic classifications or clinics.

Classifications	No.	Rel. Freq.*	Classifications	No.	Rel. Freq.*
Allergy			Gynecologic	148	5.00
food	1	.03			
other (shots)	151	5.13	GYN Clinic	335	11.39
Appliance Application	21	.71			
Cancer	7	.24	Hematology		
Cardiovascular			anemia	4	.14
hypertension	27	.92	sports anemia	2	.07
hypercholesterolemia	2	.07	other	1	.03
hypertriglyceridemia	1	.03	Immunizations	26	.88
CHD risk high/danger	5	.17	Lymphatics	28	.95
other	44	1.50	Musculo-Skeletal	272	9.25
Infectious Diseases	7	.24	Neurological	38	1.29
Dental Clinic			Parasites	6	.20
necrotizing ulcerative			Physical Exam	38	1.29
gingivitis	2	.07	Pregnancy	6	.20
pregnancy gingivitis	3	.10	Psychiatric		
excessive dental dis.	8	.27	anorexia nervosa	4	.14
periodontal disease	20	.68	bulimia	11	.37
other	295	10.03	other	17	.58
Dental Problems	6	.20	Respiratory Tract	127	4.32
EENT	593	20.16	Sexually Trans. Diseases	32	1.89
Endocrine			Tests	142	4.83
diabetes	3	.10			
hypoglycemia	1	.03	Urinary Tract Dis.	100	3.40
hypothyroidism	3	.10			
hyperthyroidism	1	.03	Weight		
other	6	.20	overweight	45	1.53
Gastrointestinal			underweight	1	.03
chronic gastritis	1	.03			
ulcers	5	.17			
inflam. bowel dis.	2	.07			
constipation	1	.03			
lactose deficiency	1	.03			
other	73	2.48			

* Rel. freq. = relative frequency.

Table 7. Number and percent of health problems with nutritional component in medical and dental clinics.

Clinics	Appointments	Nutritionally Related	
		Number	Percent
Medical Clinic	2613	127	4.9
Dental Clinic	328	33	10.1
Total Clinics	2941	160	5.4

receiving therapy for overweight had the greatest frequency with N=45 patient appointments. Since all patients were not measured for height, weight and skinfold measurements, this finding does not represent the total number of overweight students, only those receiving nutritional therapy. Forty-five overweight patients in this study represented 1.5 percent of the total patient appointments (N=2941) which is significantly less than those reported by Wein and Wilcox (1972), HANES (1975) and the Ten-State Survey (1972).

Thirty-three of the N=45 patient appointments were females and 12 were males. Probably more females were receiving professional assistance when trying to reduce weight especially in the spring (Table 9). Table 9 shows the age distribution of the major health problems with nutritional component according to clinical subgroups and ranked frequency. Twenty-one appointments were treated for overweight in the 18 to 22 year age group, 16 in the 23 to 30 year, 6 in the 31 to 40 year, and 2 in the 41 years and older (Table 9).

Only one female between the ages of 18 to 22 years was seen for an underweight problem (Table 9).

Table 8. Ranked frequency distribution of major health problems with nutritional component according to sex.

Health Problems	Number			Relative Frequency
	Male	Female	Total	
Overweight	12	23	45	28.1
Hypertension	22	5	27	16.9
Periodontal Disease	7	13	20	12.5
Bulimia	0	11	11	6.9
Excessive Dental Decay	6	2	8	5.0
Pregnant	0	6	6	3.8
Anemia	1	5	6	3.8
anemia(4)				
sports anemia(2)				
Ulcers	1	4	5	3.1
CHD risk high/dangerous	3	2	5	3.1
Anorexia Nervosa	0	4	4	2.5
Diabetes	0	3	3	1.9
Hypothyroidism	0	3	3	1.9
Pregnancy Gingivitis	0	3	3	1.9
Hypercholesterolemia	2	0	2	1.3
Inflammatory Bowel Dis.	1	1	2	1.3
Necrotizing ulcerative gingivitis	1	1	2	1.3
Hypertriglyceridemia	1	0	1	.6
Hyperthyroidism	0	1	1	.6
Hypoglycemia	0	1	1	.6
Constipation	0	1	1	.6
Lactase Deficiency	1	0	1	.6
Underweight	0	1	1	.6
Food Allergy	0	1	1	.6
Chronic Gastritis	0	1	1	.6
Total	58	102	160	100.0

Table 9. Age distribution of major health problems with nutritional component according to clinical subgroups.

Disorders	Age in Years				Total
	18-22	23-30	31-40	41+	
Body Weight					
Overweight	21	16	6	2	45
Underweight	1				1
Cardiovascular					
Hypertension	2	14	11		27
Hypercholesterolemia			2		2
Hypertriglyceridemia			1		1
CHD risk high/dangerous	2	2	1		5
Dental					
Necrotizing ulcerative gingivitis	2				2
Periodontal disease	2	8	9	1	20
Pregnancy gingivitis		2	1		3
Excessive decay	1	7			8
Eating Disorders					
Anorexia nervosa	4				4
Bulimia	11				11
Gastrointestinal					
Chronic gastritis		1			1
Ulcers	4	1			5
Inflammatory bowel disease	1	1			2
Constipation	1				1
Lactase deficiency	1				1
Endocrine					
Diabetes	1	1	1		3
Hypoglycemia	1				1
Hypothyroidism	2	1			3
Hyperthyroidism	1				1
Hematological					
Anemia	2	1	1		4
Sports anemia	2				2
Pregnancy	4	2			6
Allergy					
Food allergy			1		1
Total	66	57	34	3	160

Cardiovascular Disorders

Hypertension was ranked second in frequency with N=27 patient appointments. The N=27 patient appointments were categorized into the following age groups; 2 in the 18 to 22 years, 14 in 23 to 30 years and 11 in the 31 to 40 years (Table 9). Twenty-two of the N=27 patient visits were males and five were females (Table 8).

Two patient visits were identified with hypercholesterolemia and one with hypertriglyceridemia. All were males between the ages of 31 to 40 years (Tables 8 and 9).

CHD (coronary heart disease) risk high or dangerous was used to include two subgroups: ratio of high density lipoproteins to cholesterol, or number of coronary heart risk factors greater than three such as elevated blood pressure, elevated cholesterol, elevated triglycerides, obesity, smoking, inactivity, diabetes and heredity. Five patient appointments were identified among the age groups of 18 to 22, 23 to 30, and 31 to 40 years (Table 9). Again slightly more males (N=3) than females (N=2) were identified (Table 8). Based on the number of cardiovascular problems and overweight students the frequency of CHD risk factors may be underestimated.

Cardiovascular disorders was one of the most frequently reported clinical subgroups. This included hypertension, hypercholesterolemia, hypertriglyceridemia and CHD risk factors. The study reported 1.2 percent (N=35) of the total 2941 patient appointments or 21.9 percent of the total 160 medical problems with nutritional component. The age categorizations were as follows: 4 in the 18 to 22 years, 16 in the 23 to 30 years, and 15 in the 31 to 40 years age groups (Table 9). The

cardiovascular disorders were the only groupings that increased with age which is similar to the results found by Wein and Wilcox (1972) and Demko et al. (1980).

Dental Disorders

The frequency of dental disorders such as excessive dental caries, pregnancy gingivitis, periodontal disease and necrotizing ulcerative gingivitis was 10.1 percent of all patients (N=328) treated at the dental clinic (Table 7). This was 1.1 percent of the total patient appointments (N=2941) at the combined health and dental clinics.

Of those students assessed in the dental clinic 6.4 percent showed evidence of periodontal disease. As indicated in Table 8 more females (N=13) than males (N=7) were identified which is in conflict with the findings of Russel and Ayers (1960). Students in the 23 to 30 and 31 to 40 years age groups had the greatest frequency with 17 of 20 appointments (Table 9).

Two students among the 18 to 22 year age group were identified with necrotizing ulcerative gingivitis (Table 9). These patients were seen two to four weeks following the beginning of the quarter. This is the lowest stress time in terms of academia for most students as compared to midterm and finals. A higher frequency may have been found if this study had been conducted during the end of the quarter.

Eight patients were treated for excessive dental caries (Table 8). Table 9 shows one appointment treated in the 18 to 22 year and 7 in the 23 to 30 year age group. More males (N=7) than females were identified (N=1) with excessive dental decay which differed from the

findings reported by Pelton et al (1969). Data were not collected on each student treated for minor dental caries, only those treated for excessive dental decay.

Pregnancy gingivitis was reported in 3 females; 2 in the 23 to 30 year age group and 1 in the 31 to 40 year age group (Table 9). The number of pregnant women was not available among the population surveyed except for newly diagnosed pregnancies in the medical clinic.

Eating Disorders

Anorexia nervosa patients were treated four times during the three week period (Table 8). Even though anorexia nervosa is considered rare among the United States population, it does occur among the college aged population especially between the ages of 18 to 22 years. All patients seen for either anorexia nervosa (N=4) or bulimia (N=11) were females and between the ages of 18 to 22 years (Table 9).

Incidence of bulimia was found to be greater than the incidence of anorexia nervosa which supports the current literature. Since this was not a survey of all college students, but a survey of students seeking medical assistance, the reported frequencies are less than those of the reported literature (Halmi et al., 1981; Carter and Eason, 1983). A total of 9.4 percent of health problems with a nutritional component (N=15) was categorized as eating disorders (Table 8).

Gastrointestinal Disorders

Ulcers were reported more frequently in women than men, and were found in the 18 to 22 year age group except for one male in the 23 to

30 year age group (Tables 8 and 9). Generally, ulcer disease occurs more frequently in men than women and usually between the ages of 35 to 55 years (Zeman, 1983).

Only one case of chronic gastritis was reported in the 23 to 30 year age group (Table 8). Chronic ulcerative colitis and Crohn's disease are coded as inflammatory bowel disease in the study. One female and one male were identified in the 18 to 22 and 23 to 30 year age groups (Tables 8 and 9). This is similar to the age groups of occurrence reported by Zeman (1983) for both Crohn's and ulcerative colitis.

One male student was diagnosed with a lactase deficiency (Table 8). Based on discussions in Clinical Nutrition classes, it is likely that more students suffer from lactase deficiency and treat the symptoms by eliminating milk products.

In college students, the consequences of poor health habits such as low fiber diets, inadequate water intake, irregular meals, and lack of exercise can contribute to constipation. Only one female student was treated for this problem (Table 8).

Endocrine Disorders

The study identified 3 female diabetic patients in the following age groups: 18 to 22 years, 23 to 30 years, and 31 to 40 years Table 9. It has been reported that approximately 0.4 percent of young people are diabetic. This study reported a 0.1 percent frequency of diabetic patients receiving medical treatment at the Student Health Center (Table 6). It is possible other diabetic students are using off-campus

medical services. One female patient with hypoglycemia was treated in the 18 to 22 year age group (Table 9).

One hyperthyroid and 3 hypothyroid patients were reported (Table 8). Again, all were females with 3 in the 18 to 22 year age group and 1 in the 23 to 30 year age group (Tables 8 and 9). All eight patients treated for endocrine disorders were females (Table 8). This is the first study to report the frequency of patients treated for hypothyroidism, hyperthyroidism and hypoglycemia among college students. The numbers are small and could be due to sampling error.

Hemoglobin

The frequency of anemia was categorized into two subgroups: anemia and sports anemia. After altitude adjustment, hemoglobin levels less than 13.5 mg/dl for males and 12.0 mg/dl for females were considered to be indicative of anemia. Sports anemia was reported when an individual who works out physically four times a week for a period of time greater than 30 minutes had hemoglobin levels less than 14 mg/dl in males or hemoglobin levels less than 12 mg/dl in females (Pate, 1983). Four females were identified as anemic and one female as sports anemic while only one male was diagnosed as sports anemia (Table 8). Not all students seen at the health center were screened for hemoglobin levels, only those patients per doctor's orders. The age categorizations were as follows: 4 in the 18 to 22 years, 1 in the 23 to 30 years, and 1 in the 31 to 40 years age group (Table 9).

Pregnancy

Six women were identified as pregnant; 5 in their first trimester and 1 in her second trimester (Table 8). Four women were in the 18 to 22 years age group and 2 in the 23 to 30 years (Table 9). The procedure at the student health center is to refer all newly diagnosed pregnant women to an off-campus physician for obstetrical care. The nurse practitioner at the Student Health Center sees all newly diagnosed pregnant mothers for an educational program including nutrition during pregnancy.

Food Allergy

Only one patient between the ages of 31 to 40 was identified with food allergies, but 151 student appointments were for allergy shots which probably includes some students with food allergies (Tables 6 and 9).

Number of Students Using the Health Center

According to the Montana State University Registrar's Office, enrollment spring quarter 1984 was 10,255 students. Of the total enrollment, 43.1 percent (N=4420) were females and 56.9 percent (N=5835) were males. Table 10 shows the number and percentages of males and females that used the Swingle Student Health Center during a three week period.

Of the N=2941 patient appointments coded at the health center, N=1862 individual students were treated for medical or dental problems. Nine percent more females (N=1016) than males (N=843) were seen at the

Table 10. Number and percent of M.S.U. students using the Swingle Health Center.

	Male		Female		Total	
	No.	%	No.	%	No.	%
M.S.U. enrollment	5835	56.9	4420	43.1	10,255	100
Students using Health Center	843	45.3	1016	54.6	1,862*	100
Percent of those enrolled using Health Center		14.4		23.0		18.2

* .5 percent of N=1862 patients sex not indicated.

center (Table 10). This difference is due largely to the significant number of females (N=335) being seen in the GYN clinic for routine check-ups or contraception. Only nine students were not identified by sex in the study.

During the three week period, 23 percent of the females and 14.4 percent of the males enrolled at MSU used the services at the Swingle Student Health Center or dental clinic. This represented 18.2 percent of the combined total males and female enrollment (Table 10).

Table 11 shows the mean number of appointments per student. The mean number of health or dental appointments per student was 1.58, with a range of 1 to 22 appointments (Table 11). One student was treated for a skin disorder requiring twice daily a change of dressing.

Table 12 shows the age distribution of the N=2933 patient appointments. The majority of students using the health and dental clinics were between the ages of 18 to 22 years; this included 55 percent (N=1612) of the total number of appointments. The second age group was the 23 to 30 years with 36.6 percent; third group was the 31

Table 11. Mean number of appointments per students.

Students	Number of appointments per student		
	Mean	Mode	Range
1862	1.58	1	1 to 22

Table 12. Age distribution of appointments.

Age	Number	Percent
18-22	1612	55.0
23-30	1074	36.6
31-40	217	7.4
41+	30	1.0
Total	2933*	100.0

* 0.3 percent of N=2941 appointments age not indicated.

to 40 years with 7.4 percent and the last age group was 41 years and greater with 1 percent of the total appointments (Table 12). As the age of the student increased the number of patients using the Health Center decreased. Eight patient visits (0.3 percent) of the N=2941 patient appointments could not be categorized by age.

Nutrition Services

Another purpose of the study was to determine if the Swingle Student Health Service is adequately staffed with regard to nutritional services. At the time of this study, the health service had employed a part-time registered dietitian. The dietitian provided nutritional therapy to 39 appointments in 28 hours during the study period of 3 weeks (Table 13). This averaged 13 appointments in a 9.3 hour work week. Each appointment varied in length from one hour for an initial appointment to 15 to 30 minutes for follow-up appointments.

Table 13. Number of students seen by the dietitian.

Dietitian	Study Total	Average Per Week
Appointments	39	13
Work hours	28	9.3
Average number patients per hour	1.39	
Average minutes per appointment	43.0	

All initial appointments were seen for a minimum of one hour. Anorexia nervosa and bulimic patients required follow-up appointments usually 30 minutes in length once a week. Overweight clients may be scheduled for follow-up visits 15-30 minutes in length weekly. Including a variety of initial and follow-up appointments the dietitian averaged 43 minutes per patient. Of the N=160 health problems with a nutritional component, the dietitian provided nutritional therapy to 24.4 percent (N=39) of the students.

Doctors, nurses, and dental staff members referred 16 new clients to the dietitian during the three week study. The dietitian's appointment calendar is generally full one week in advance because of the limited appointments on a part-time service. Two-thirds of these referrals would not be seen by the dietitian for at least two weeks. Based on the number of referrals from various health professionals, the number of clients requiring on-going follow-up, and the number of student initiated referrals, the nutritional services were not adequately staffed at the Swingle Student Health Center at the time this study was conducted.

CONCLUSIONS

The purpose of the study was to determine the proportion of college students with nutritional health care needs from a sample of (N=2941) Montana State University students being treated at the Swingle Student Health Center and dental clinic during three weeks of the spring quarter. This is the first study to report the frequency of medical problems with a nutritional component among college students according to the literature surveyed. The study found that 5.4 percent of all appointments were seen for health problems with a nutritional component. The clinical subgroups ranked in order of frequency were weight problems, dental disorders, cardiovascular disorders, eating disorders, gastrointestinal disorders, endocrine disorders, pregnancy, anemia and food allergies.

The proportion of health problems with nutritional component reported in the study do not represent incidences of these disorders among college students, only the number of clients receiving medical or dental treatment during a specific time period.

Students receiving nutritional therapy for overweight had the greatest frequency with N=45 patient appointments. Hypertension ranked second in frequency with N=27 appointments, periodontal disease ranked third with N=20 appointments, and bulimia ranked fourth with N=11 appointments.

Cardiovascular disorders were the only clinical subgroup that

increased with age. This is similar to the results found by Wein and Wilcox (1972) and Demko et al. (1980). The health problems that were more prevalent in females were overweight, periodontal disease, bulimia, pregnancy, anemia, ulcers, anorexia nervosa and diabetes. Males were treated more frequently for hypertension, excessive dental decay, hypercholesterolemia and hypertriglyceridemia.

The literature has reported some nutritional health problems in college students such as: overweight, hypertriglyceridemia, hypercholesterolemia, hypertension, high CHD risk factors, anorexia nervosa, bulimia and anemia. This study reported college students also receiving treatment for ulcers, inflammatory bowel disease, chronic gastritis, constipation, lactase deficiency, pregnancy, food allergies, periodontal disease, necrotizing ulcerative gingivitis, pregnancy gingivitis, diabetes, hypoglycemia, hypothyroidism, and hyperthyroidism.

During the three week study period, 23 percent of the females and 14.4 percent of the males enrolled at MSU used the services at the Health Center or dental clinic. This was 18.2 percent of the total enrollment.

Of the total appointments (N=2941), N=1862 individual students were treated for health or dental problems. The mean number of appointments per student was 1.58.

One of the study's objectives was to evaluate the nutrition services at the Health Center. The registered dietitian saw 39 appointments in 28 hours. Each appointment varied in length from 15 to

60 minutes. All initial appointments were seen for 60 minutes. Eating disorders and weight reduction clients needed to be scheduled more frequently for follow-up monitoring.

Health professionals referred 16 new clients to the dietitian for nutrition therapy. Based on the dietitian's full schedule and number of referrals including the number of overweight, anorexia nervosa and bulimic clients, the nutrition services at the Swingle Student Health Center were inadequate.

The students' health care planning could be more comprehensive and would better meet their health needs if the number of hours providing nutritional therapy were increased. It is recommended that the dietitian's services be increased to 16 to 20 hours weekly.

Since the coding of health problems required adding new subletters to already existing codes, it is felt that many patients were not coded correctly for diagnosis and services received. Computerized forms and coding system could eliminate many errors and provide a more accurate data collection for future health care planning.

Other limitations of the study were the limited time of data collection and specific quarter surveyed. For further research, it is recommended that data collection be increased to four weeks once each quarter at the Swingle Student Health Center. In addition, this study did not provide Montana State University with the percent of overweight students, only those students receiving therapy for overweight at the Swingle Student Health Center. Further research should include anthropometric measurements of a representative sample of Montana State

University students. Finally, since the results of this study cannot be generalized to the college population of other geographic regions of the United States it is recommended that similar surveys be conducted by other college student health services.

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APPENDIX

Swingle Student Health Center Diagnostic Classification & Coding Sheet

CODE	INCLUDES
1. Allergy a. food b. other	Asthma, food allergies, desensitization, hay fever
2. Appliance Application	Braces, Casts, Collars, Splints, Crutches
3. Cancer a. anorexia b. nausea & vomiting c. weight loss d. other	
4. Cardiovascular a. hypertension b. hypercholesterolemia c. hypertriglyceridemia d. CHD high risk/dangerous e. other	BP, Cardiac, Arterial & Venous Problems
5. In House Consultation/Referral a. advice, discussion b. Doctor c. Nurse d. Dietitian e. Counseling Center f. other	Advice, Discussion, Referrals
6. Infectious Diseases	Inf. Mono, Chickenpox, Measles, Mumps, Etc.
7. Dental-Oral	Teeth, Tongue, Gums
8. EENT	Tonsils, Sinuses, Otitis Media & Externa
9. Emergency	Holiday, Night, Weekend

- | | |
|--------------------|--|
| 10. Endocrine | Diabetes, Thyroid, Adrenal,
Pituitary, Etc. |
| a. diabetes | |
| b. hypoglycemia | |
| c. hypothyroidism | |
| d. hyperthyroidism | |
| e. other | |
-
- | | |
|---|---|
| 11. Gastrointestinal | Gastroenteritis, Pancreas, Ano-
rectal |
| a. chronic gastritis | |
| b. ulcers | |
| c. inflammatory bowel disease
(ulcerative colitis, crohns) | |
| d. chronic diarrhea
(greater than 2 weeks) | |
| e. constipation | |
| f. gluten enteropathy | |
| g. lactase deficiency | |
| h. hepatitis | |
| i. pancreatitis | |
| j. cholecystitis | |
-
- | | |
|-----------------|----------------------------------|
| 12. Gynecologic | PID, Ovary, Genitalia, Vaginitis |
|-----------------|----------------------------------|
-
- | | |
|----------------|--------------------|
| 13. GYN Clinic | Contraception, Pap |
|----------------|--------------------|
-
- | | |
|--|------------------|
| 14. Hematology | Anemia, Leukemia |
| a. anemia | |
| b. sports anemia (works out
4 times/week for 30 min.) | |
| c. other | |
-
- | | |
|-------------------|--|
| 15. Immunizations | |
|-------------------|--|
-
- | | |
|----------------|--------------------------|
| 16. Lymphatics | Adenopathy, Lymphangitis |
|----------------|--------------------------|
-
- | | |
|---------------|----------------------------|
| 17. Metabolic | Lipids, Electrolytes, Gout |
| a. gout | |
| b. other | |
-
- | | |
|----------------------|--|
| 18. Musculo-Skeletal | Sprain, Disloc., Fract., Tendon.
Arthritis, Contusion, Hernia |
|----------------------|--|
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- | | |
|----------------|----------------------------|
| 19. Neurologic | Epilepsy, Headache, MS, MD |
|----------------|----------------------------|
-
- | | |
|-----------|--|
| 20. Nurse | |
|-----------|--|
-
- | | |
|------------------------------------|--|
| 21. Nutrition Therapy | |
| a. weight management | |
| b. eating disorder (bulimia) | |
| c. diet modification (instruction) | |

- d. risk factor modification (cardiovascular)
 - e. anorexia nervosa
-
22. Parasites LICE, Scabies, Ticks, Worms
-
23. Pharmacy
-
24. Phone Call
-
25. Physical Exam Athletics, Employment
-
26. Physical Therapy
-
27. Pregnancy
- a. first trimester
 - b. second trimester
 - c. third trimester
-
28. Psychiatric Anxiety, Depression, Etc.
- a. anorexia nervosa
 - b. bulimia (binging & purging)
 - c. obesity
 - d. other
-
29. Resp. Tract-Lower Pneumonia, Bronchitis
-
30. Sexually Transmitted Dis. Herpes, GC, NGU, Venereal Warts
-
31. Skin Burns, Lacerations, Rashes, Warts, Abscess
-
32. Specialist Referral (Off Campus Medical Consultation or Service)
-
33. Tests TB, EKG, Audiogram, Chemistries
-
34. Urinary Tract Disease Cyctitis, Urethritis, Nephritis
-
35. Physician
-
36. Dietitian
-
37. Dental Clinic
- a. necrotizing Ulcerative gingivitis
 - b. diagnosed bulimia
 - c. suspected bulimia
 - d. angular cheilosis (suspected)
 - e. excessive decay
 - f. pregnancy gingivitis
 - g. periodontal disease
-
38. Underweight
-

(continued)

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student nutritional needs...

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