hEALTH cLINIC ENVIRONMENTS IN GEORGIA ELEMENTARY SCHOOLS

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by

SUSAN ROGERS SIMPSON

(Under the Direction of C. KENNETH TANNER)

ABSTRACT

Schools seem to be the logical place to serve the health needs of students, since children spend a majority of their time there. Design standards were not available for health clinics in Georgia elementary schools; therefore, this study examined key characteristics of an elementary school clinic in order to determine the importance of each design element. Eleven design classifications and 12 specific design elements were determined through a review of related literature. Characteristics included: components (rooms), space, and size; general design elements; location; accessibility; the waiting area; the nurseís office; the treatment room; the isolation area; the restroom (toilet); security, storage, and safety elements; and furnishings/treatments. Specific design elements included: lighting; windows; integrating nature elements into design; promoting a sense of well-being for users; security and privacy/confidentiality elements; electrical/plumbing elements; doors and wayfinding (signage); walls and ceilings; acoustics; use of color; heating/ventilation/air conditioning; and flooring elements. This information was incorporated in a survey of 12 experts involved with designing, building, and managing school facilities and 104 school nurses. An item analysis was completed on each design statement. Descriptive statistics and ANOVAs were completed on characteristics and specific design elements. Statistical significance between the groups was found for design characteristics: components (rooms), space and size; the waiting area; the nurseís office; and the treatment room. School nurses perceived these characteristics to be more important to clinic design than the advisory panel did. In addition, statistical significance between groups was found for these specific design elements: integrating nature elements; promoting a sense of well-being; security and privacy/confidentiality; and heating/ventilation/air conditioning. Again, school nurses perceived these specific design elements to be more important to clinic design than the advisory panel of architects, builders, consultants, and facility planners did. School nurses commented that the survey statements presented an ideal clinic design. The advisory panel commented that many of the survey statements were not cost effective. Establishing design guidelines for health clinics in Georgia elementary schools were recommended, and the guidelines should be written using the professional judgment of school nurses, representatives of users of the clinic, and the findings of this study.

INDEX WORDS: School Facilities, School Design, Health Clinic, Design Elements, Elementary School, School Nurse

CHAPTER 1

NATURE OF THE STUDY

Health and learning have intertwined throughout history (The Center for Health and Healthcare in Schools, n.d.a; Symons, Cinelli, James, & Groff, 1997). Therefore, schools seem to be the logical place to serve the health needs of students since children spend a majority of their time, about 14,000 hours, in schools (Barnett, Niebuhr, & Baldwin, 1998; Bradley, 1997; Carlson, Paavola, & Talley, 1995; Gump, 1978; Koenning et al., 1995; Pena, 2000). As a result, the school became the link between education, health, social services, and other support services that children and families needed (Bush, 1997; Dryfoos, 1994).

Controversy surrounds the issue of offering health care services in schools (Francis, Hemmat, Treloar, & Yarandi, 1996; Institute of Medicine, 1997). A number of developments have weakened the argument against health care delivery in schools. The literature suggests that the physical and psychological health of children has a direct impact on their academic and social development in school (Bush, 1997; Dryfoos, 1997; Hacker & Wessel, 1998; Jang, 1994; Morgan, 1987; Ouellette, 2001; Passerelli, 1994; Symons, et al., 1997; Tyson, 1999). Pena (2000) stated:

> Conditions of poverty, emotional and psychological distress, child abuse, poor nutrition, disease, inadequate preventive and health maintenance practices Öweaken and imperil the academic and future lives of students. Hence, health careÖin public schools probably starts with administrators and school personnel becoming aware of the health status of students and continues with their recognizing that health care assistance is not charity. It is a right that students are entitled to by law. (p. 200)

The concept and practice of inclusion are putting significant numbers of students with disabilities in the regular classroom (Bartlett, Parette, & Holder-Brown, 1994). Existing federal legislation mandates that health services be provided for children with disabilities and health problems (Americans with Disabilities Act, 1990; Individuals with Disabilities Education Act, 1990 & 1997; Section 504 of the Rehabilitation Act, 1973). School nurses are key players in the delivery of health services in the school setting (Passarelli, 1994). Some school nurses are itinerant staff members, some nurses are full-time sole staff members of the school health clinic, and some nurses are integral staff members of full-service health centers located in a school setting. The past and current roles of the professional school nurse are described throughout the professional

literature (Brindis et al., 1998; Clemen-Stone, Eigsti & McGuire, 1991; Costante & Smith, 1997; Cromwell, 1946, 1963; Dryfoos, 1998; Edwards, 1987; Fryer & Igoe, 1996; Hacker & Wessel, 1998; Nelson, 1997; Oda, 1979; Passarelli, 1995; Small et al., 1995; Smiley, 1958; Wold & Dagg, 1978; Woodfill & Beyrer, 1991). School nurses provide ìhealth counseling, health instruction, and health services on an individual or small group basisî (Woodfill & Beyrer, 1991, p. 57).

Often, health-related procedures are performed in inadequate conditions and facilities in public schools. School settings for the health clinic vary from clinics operating from hallways and closets (Woodfill & Beyrer, 1991) to full-service clinics supported by a hospital or other medical organization (Dryfoos, 1997). Public schools need additional funding to hire school nurses and, in some instances, to remodel existing or build new facilities to accommodate the needs of medically fragile children and the increasing health needs of students. The American Federation of Teachers (AFT) manual (1992) states:

> The placement ofÖmedically fragile children in public schools and the responsibilities for care these placements require have given rise toÖthe need for adequate funding, availability of appropriate facilities, new roles and responsibilities for school personnel, appropriate training, and legal and liability issues. (p. 9)

Statement of the Problem

Since the introduction of the first school nurse in 1902, schools have provided some access to health education and care for students (Kellogg Foundation, 2000). Barnett, et al. (1998) stated that schools were ìa natural setting for the co-location of integrated community health and social servicesî (p. 99). Other researchers reported that providing health services to students in schools affected student achievement (Bush, 1997; Igoe, 1998; Jang, 1994; Koenning et al., 1995; Passerelli, 1994).

Planners for new schools and for renovations of existing school buildings have explored designs that encouraged and stimulated learning. Planners may explore adding clinics to school designs to assist students in learning. While design standards are necessary for each component of the school building, clinic design standards and characteristics are not available for Georgia schools. According to R. Nance (personal communication, July 1, 2002), an architect with the Georgia Department of Education, ìThere are no DOE standards for clinics at this time. The design decisions are left to the local system and their architect.î J. Allers (personal communication, July 23, 2001), the manager for the School Health Department of Childrenís Healthcare of Atlanta, wrote:

> We are happy right now when nurses get running water, soap, paper towels, a private toilet for sick children, and a place to lock up meds, i.e. a locking file cabinet. We have nurses in GA without a health room of any kind. Phones and computers are nice.

Literature about successful classroom and school design existed and literature about successful designs for hospital and ambulatory care

facilities was available; however, research and literature on design for school clinics and health clinics in elementary schools was very limited. Sanoff (1994) wrote that the people who actually used the school building rarely assisted in the design process. Instead, architects, builders and others who did not use the building designed schools. This study offered professional school nurses, as well as architects, builders, consultants, and planners of school facilities, an opportunity to express their perceptions about design characteristics for an elementary school health care clinic.

Purpose of the Study

The purpose of this study was to compare perceptions of school nurses, architects, builders, consultants, and planners for school facilities regarding design characteristics of an elementary school health care clinic. To accomplish this purpose, this study included a review of the major literature on the relationship between health and learning, on factors that affect the health of students, on using schools as a healthcare delivery system, on the status of school facilities, on the history of school nurses, and on the design characteristics of an elementary health care clinic. Based on the responses, key clinic design elements items were identified and were utilized to develop recommendations for facility guidelines for an elementary school health care clinic.

Research Questions

The research question that guided this study was: What were the perceptions of architects, builders, consultants, planners of school facilities and school nurses concerning the key design elements for an elementary school health clinic?

1. Is there a statistically significant difference between the perspectives of practicing school nurses (practitioners) and the advisory panel regarding the 11 design classifications?

a) Components, space, and size elements

b) General design elements

c) Location of the clinic

d) Accessibility to the clinic

e) Waiting area

f) Nurseís station/office

g) Examination/treatment room

h) Rest/isolation area

i) Restroom

j) Security, storage and safety for the clinic

k) Furnishings and treatments of the clinic

2. Is there a statistically significant difference between the perspectives of practicing school nurses (practitioners) and the advisory panel regarding the 12 specific design clusters?

a) Lighting/daylighting elements

b) Windows elements

c) Integration of nature elements into the design

d) Promotion of a sense of well-being for users

e) Use of color

f) Privacy, space and confidentiality issues

g) Heating, venting and air conditioning elements

h) Electrical and plumbing elements

i) Acoustics

j) Wall/ceiling elements

k) Flooring

l) Door/wayfinding (signage) elements

The research question and its components guided the review of the literature. A comprehensive survey including spaces for comments or concerns for each design element was developed based on the findings of the literature review. A small group of school nurses responded to the survey for readability and clarity. The survey was sent to the advisory panel and was administered to a larger group of school nurses to gather statistical data for this study.

Definition of Terms

For the purposes of this study, terms were defined as follows:

1. Advisory Panelóprofessional architects, builders, consultants, and planners of facilities having expertise and certification

in specialized areas of school construction and design.

2. Professional School Nurseóa person who acquired Georgia certification in nursing and who was currently working as a nurse in a public school.
3. Design Elementsósets of principles by which facilities were planned and built.
4. Elementary Schooléa school composed of grades pre-K through fifth.

Importance of the Study

This study will make needed contributions to the existing small research base and to the identification process of key design elements and characteristics for elementary school health care clinics. The contributions were based upon the perceptions of school nurses, architects, builders, consultants, and facility planners for elementary school facilities. The more effective and efficient clinics may improve the school nurseís impact on the health of students and staff members of the school.

Limitations of the Study

This study was limited by several factors. The survey instrument was limited to the knowledge and ideas found in the researcherís review of the literature. Open-ended comments/concerns sections were added to the survey to obtain ideas not found in the literature review. The use of a selected advisory panel and the school nurses attending a Georgia Association of School Nurses conference to complete the survey instrument prevented random selection of participants. Results were limited to the areas of their expertise. The study was limited geographically since all survey participants resided in the state of Georgia.

Assumptions

This study assumed that the staff of a clinic had expertise to offer regarding facility needs; hence, it offered professional school nurses, as well as architects, builders, consultants, and planners for school facilities, an opportunity to express their perceptions about elementary health clinic design needs. The researcher assumed that the responses of the survey and open-ended comments/concerns sections were an accurate reflection of the true perceptions of the participants.

Organization of the Remainder of the Study

This study was organized into five chapters. Chapter 1 included the introduction to the study, the statement of the problem, the purpose of the study, the research questions, and the definition of terms.

Chapter 2 presented a review of the related literature including the relationships between health and learning and health and socioeconomic status, access to health, schools as a healthcare delivery system, facilities, the history of school nurses, specific design elements of a health care clinic, and design classifications for an elementary health care clinic. A table listing research regarding design elements was included in Appendix A.

Chapter 3 described the design of the study. This chapter included the research questions that guided the study, descriptions of the participants, the instrumentation used to gather data, the method for gathering the data, and the planned statistical treatment of the data.

In Chapter 4, all findings related to the research questions were reported, and in Chapter 5, a summary of the research study was provided along with recommendations and implications for further research for design needs for elementary school health care clinics.

Chapter 2

Review of Literature (truncated)

Conclusion

The role and the responsibilities of the school nurse continue to be dependent on the needs of the students served and the availability of funding sources in the community. The school continues to be an efficient site for health care delivery; however, it is highly unlikely that funds will be available to implement fully staffed and equipped school-based clinics at each school. Communities and boards of education should make use of the school nurseóthe professional who represents a host of dedicated professionals working in the field of school health care.

New school facilities will continue to be built and existing school facilities will be renovated as needed. This study offered professional school nurses, as well as architects, builders, consultants and planners of school facilities, an opportunity to express their perceptions about design characteristics for an elementary school health care clinic. These design characteristics may be used to write state facility guidelines for school clinics that could assist school nurses and delegated school personnel in meeting the health care needs of students more effectively.

CHAPTER 3

DESIGN OF THE STUDY

Design standards and elements are needed for each component or room in the school building. Literature about successful classroom and school design existed and literature about successful designs for hospital and ambulatory care facilities was available; however, research on design for school clinics in elementary schools was very limited. There was little published literature to inform or guide designers, facility planners, builders, architects, or researchers about successful school clinic design.

A review of the literature examined the relationship between health and learning, the factors that affected the health of students, the basis for using schools as a part of the healthcare delivery system, the history of school nurses, and the current roles and responsibilities of school nurses. The literature review provided the identification of design elements used in hospital and ambulatory care facilities and in successful school design. The purpose of this study was to compare perceptions of school nurses, architects, builders, consultants, and planners for school facilities regarding design characteristics of an elementary school health care clinic.

Research Questions

The research question that guided this study was: What were the perceptions of architects, builders, consultants, planners of school facilities, and school nurses concerning the key design elements for an elementary school health clinic?

1. Is there a statistically significant difference between the perspectives of practicing school nurses and the advisory panel regarding the 11 design classifications?
    a) Components (rooms), space, and size elements
    b) General design elements
    c) Location of the clinic
    d) Accessibility to the clinic
    e) Waiting area
    f) Nurseís station/office
    g) Examination/treatment room
    h) Rest/isolation area
    i) Restroom (toilet)

j) Security, storage and safety for the clinic

k) Furnishings and treatments of the clinic

2. Is there a statistically significant difference between the perspectives of practicing school nurses and the advisory panel regarding the 12 specific design clusters?

a) Lighting/daylighting elements

b) Windows elements

c) Integration of nature elements into the design

d) Promotion of a sense of well-being for users

e) Use of color

f) Privacy, space and confidentiality issues

g) Heating, venting and air conditioning elements

h) Electrical and plumbing elements

i) Acoustics

j) Wall/ceiling elements

k) Flooring

l) Door/wayfinding elements

Participants

The advisory panel included architects, builders, consultants, and facility planners of elementary schools. The second group of survey participants was a small group of four school nurses. The survey was administered to 100 school nurses attending the annual Georgia Association of School Nursesí conference.

Instrumentation

The researcher generated a demographics sheet for the survey. A comprehensive survey on 100 health clinic design elements was developed based on the findings of the literature review. Spaces for comments or concerns for each design element were provided for the survey participants. A 10-point Likert Scale indicating the degree of importance for the design element, ranging from very low to very high, was used to

rate each survey statement.

Method

A select group of four school nurses completed the survey for reliability, readability, and clarity. The survey was mailed to 12 selected members of the advisory panel to provide comparison data for the survey. Finally, the researcher attended the annual school nursesí conference in Savannah on July 25, 2004. One hundred school nurses attending the conference completed the survey.

Statistical Treatment

Descriptive procedures were used to produce means and standard deviations for the 11 design classifications and the 12 specific design elements. Likert scale questions were appropriate to print means for since the number that was coded for a question gave a direction for the average answer. A minimum and maximum value showed the range of answers given by the survey population. An item analysis was computed for each of the 100 design statements or variables.

According to SPSS, a Cronbachís alpha was computed to ìmeasure how well a set of items (or variables) measure a single unidimensional latent construct. Cronbachís alpha is not a statistical test but is a coefficient of reliability (or consistency). In this study, identification of key design classifications for the health clinic was the latent construct. Cronbachís alpha was a function of the number of items and the average inter-correlation among these items. As the inter-item correlation increased, Cronbachís alpha increased as well and there was evidence that the items were measuring the same underlying construct producing high reliability. The survey instrument provided a large number of statements for review. The high alpha for the 11 design classifications indicated consistency in measuring these classifications.

Tests for homogeneity of variances were computed for the 11 design classifications and the 12 specific design elements. To find out if there were significant differences between the means of the two groupsóGroup 1, practicing school nurses; and Group 2óarchitects, builders, consultants, and planners for school facilitiesó an analysis of variance (ANOVA) was computed for the 11 design classifications and for the 12 specific design elements.

CHAPTER 4

FINDINGS

This chapter presents the results of the surveys completed by seven members of the advisory panel and 104 practicing school nurses. The results, an analysis of the results, and a summary are included in this chapter.

Survey Results

Following the data collection procedures as described in Chapter 3, an analysis was conducted on the survey data. Data from 111 surveys were used. Respondents were divided into two groupsóarchitects, builders, consultants, and planners for school facilities and school nurses. Demographic data were coded and entered as variables 1ñ31. Design element statements on the survey were considered individually, as design cluster variables, and as cluster variables for a specific design element.

A Likert scale of 1 to 10 was used to indicate the respondentís perception of the importance of the statement to the design of a health clinic in an elementary school. This analysis reported the degree of importance for each statement and for each cluster in the survey. Results for each cluster, for specific design elements clusters, and differences between groups are discussed and presented in tables in this chapter.

Design Cluster Variables

Eleven design cluster variables were identified and abbreviated for reporting purposes. These design cluster variables occurred naturally on the survey instrument with the first statement on the survey coded as variable 32. Assigned variable numbers are in parentheses at the end of each statement on the survey in Appendix A. An item analysis in Appendix B was completed on each of the 100 variables.

The first design cluster for components, size and space requirements (CSSR), had five statements, variables 32--36. The general design elements (GDR) cluster had 13 statements, variables 37--49. Location of the health clinic (LOC) had 7 statements, variables 50--56. Accessibility (ACC) had three statements, variables 57--59. The waiting area (WAIT) had six statements, variables 60--65. The nurseís office (NOFF) had 16 statements, variables 66--81. The treatment room (TRRM) had 26 statements, variables 82--107. The rest/isolation area (ISOL) had five statements, variables 108--112. The restroom or toilet room (RESTR) had nine statements, variables 113--121. Security, storage and safety (SSS) had six statements, variables 122--127. Furnishings and treatments (FURN) had four statements, variables 128--131.

Reliability

The internal consistency of the survey statements was calculated with an alpha coefficient or Cronbachís alpha since the survey was administered only one time to the expert group and the group of practicing nurses; and a Likert scale was used to indicate preference rather than right versus wrong answers. Cronbachís alpha is a function of the number of items and the average inter-correlation among the items. The inter-item correlation produced a satisfactory alpha for each design cluster variable. Since the inter-item correlations were high, there was evidence that the items were measuring the same underlying construct. Table 1 reports the standardized alpha for each of the design cluster

variables. The reliability coefficient of .65 or higher was accepted by the researcher

Design Cluster Variables

Table 1 displays the descriptive statistics for the 11 design cluster variables for all respondents. All design cluster variables were perceived as having at least a medium degree of importance to clinic design. The mean score for components (rooms), size and space requirements (CSSR) received the highest score of 8.86, and the isolation room (ISOL) score of 5.77 was the lowest mean score.

Analysis for Design Cluster Variables

The research question was stated as follows: Is there a statistically significant difference between the perspectives of practicing school nurses and the advisory panel regarding the 11 design classifications? The means and standard deviations for the perspectives of the two groups are given in Table 2. Group 1 identified school nurses, and Group 2 identified the advisory groupó architects, builders, consultants, and planners of school facilities.

Table 2 also shows the variances for the tests of homogeneity. Since all significance levels were greater than .05, the variances were found to be homogeneous and the spread or variance of mean scores for the two groups, nurses and the advisory panel , was approximately equal

Table 3 displays the statistically significant differences between the two groups for the following variable clusters: CSSR, WAIT, NOFF, and TRRM. For example, regarding the cluster representing components (rooms), size and space (CSSR or statements 1 through 5) $F_{1,109} = 4.40$, $p \leq .04$. Further investigation revealed that the Nurses perceived these items to be significantly more important than did the advisory panel (Mean for Nurses = 8.93; Mean for Panel = 7.89).

Table 1

Descriptive Statistics for Design Cluster Variables

Cluster	Statement Number	Variable Number	Standardized Alpha	N Valid/ N Missing	Mean	Standard Deviation
Components or Rooms, Space, and Size Requirements (CSSR)	1 - 5	32 - 36	.74	111/0	8.87	1.30
General Design Elements (GDE)	6 - 18	37 - 49	.91	111/0	6.83	1.77

Location of the Health Clinic (LOC)	19 - 25	50 - 56	.77	111/0	6.82	1.64
Accessibility (ACC)	26 - 28	57 - 59	.69	111/0	7.05	1.94
Waiting Area (WAIT)	29 - 34	60 - 65	.84	110/1	6.22	1.96
Nurseís Office (NOFF)	35 - 50	66 - 81	.93	111/1	7.97	1.48
Treatment Room (TRRM)	51 - 76	82 - 107	.96	110/1	6.97	1.84
Rest/Isolation Area (ISOL)	77 - 81	108 - 112	.88	111/1	5.77	2.41
Restroom or Toilet (RESTRM)	82 - 90	113 - 121	.81	111/1	7.03	1.86
Security, Storage, and Safety (SSS)	91 - 96	122 - 127	.80	111/0	7.29	1.81
Furnishings and Treatments (FURN)	97 - 100	128 - 131	.85	110/1	6.60	2.24

Table 2

Group Statistics for Design Cluster Variables
Group 1 - Nurses; Group 2 ñAdvisory Panel of Architects, Builders, Consultants, Planners

Cluster	Group	N	Mean	SD	Minimum	Maximum	Levene Statistic	Degrees of Freedom	Standardized Alpha
Components, Space, and Size (CSSR)	1	104	8.93	1.23	4.00	10.00	2.44	1,109	.12
	2	7	7.89	1.90	5.20	10.00			
	Total	111	8.86	1.30	4.00	10.00			
General Design Elements (GDE)	1	104	6.88	1.78	1.77	9.85	.63	1,109	.43
	2	7	6.01	1.53	2.85	7.46			
	Total	111	6.83	1.77	1.77	9.85			

Location of the Health Clinic (LOC)	1	104	6.88	1.62	2.14	10.00	.00	1,109	.96
	2	7	6.00	1.90	2.00	7.71			
	Total	111	6.82	1.64	2.00	10.00			
Accessibility (ACC)	1	104	7.06	1.93	1.67	10.00	.08	1,109	.78
	2	7	6.81	2.24	3.33	10.00			
	Total	111	7.05	1.95	1.67	10.00			

Table 2 Continued

Group Statistics for Design Cluster Variables:
Group 1 - Nurses; Group 2 ñ Advisory Panel of Architects, Builders, Consultants, Planners

Cluster	Group	N	Mean	SD	Minimum	Maximum	Levene Statistic	Degrees of Freedom	Standardized Alpha
Waiting Area (WAIT)	1	103	6.34	1.92	1.67	10.00	.08	1,108	.76
	2	7	4.50	1.87	2.33	7.33			
	Total	110	6.22	1.96	1.67	10.00			
Nurseís Office (NOFF)	1	104	8.11	1.30	2.19	10.00	1.91	1,109	.17
	2	7	5.95	2.39	1.13	8.88			
	Total	111	7.97	1.48	1.13	10.00			
Treatment Room (TRRM)	1	103	7.09	1.81	1.58	10.00	1.04	1,108	.31
	2	7	5.33	1.38	3.46	7.46			
	Total	110	6.97	1.84	1.58	10.00			

Rest/Isolation Area (ISOL)	1	104	5.84	2.43	1.00	10.00	.62	1,109	.43
	2	7	4.66	1.92	2.00	7.20			
	Total	111	5.77	2.41	1.00	10.00			

Table 2 Continued

Group Statistics for Design Cluster Variables
Group 1 - Nurses; Group 2 ñ Advisory Panel of Architects, Builders, Consultants, Planners

Cluster	Group	N	Mean	SD	Minimum	Maximum	Levene Statistic	Degrees of Freedom	Standardized Alpha
Restroom (RESTRM)	1	104	7.04	1.89	1.11	10.00	1.44	1,109	.23
	2	7	6.84	1.41	4.78	9.22			
	Total	111	7.03	1.86	1.11	10.00			
Security, Storage, and Safety (SSS)	1	104	7.35	1.83	1.33	10.00	2.29	1,109	.13
	2	7	6.36	1.13	4.67	7.67			
	Total	111	7.29	1.81	1.33	10.00			
Furnishings and Treatments (FURN)	1	103	6.70	2.26	1.00	10.00	2.70	1,108	.10
	2	7	5.21	1.27	3.25	6.75			
	Total	110	6.60	2.24	1.00	10.00			

**p≤.05*

Table 3

Analysis of Variance (ANOVA) for Design Cluster Variables Between Nurses and the Advisory Panel of Architects, Builders, Consultants, and Planners of School Facilities

Cluster		Sum of Squares	Degrees of Freedom	Mean Squared	F	p
Components (rooms), Space, and Size Requirements	Between Groups	7.16	1	7.16	4.40	.04*
	Within Groups	177.57	109	1.63		
	Total	184.73	110			
General Design Elements	Between Groups	4.96	1	4.96	1.60	.21
	Within Groups	338.77	109	3.11		
	Total	343.73	110			
Location of the Health Clinic	Between Groups	5.04	1	5.04	1.88	.17
	Within Groups	292.29	109	2.68		
	Total	297.33	110			

Table 3 Continued

Analysis of Variance (ANOVA) for Design Cluster Variables Between Nurses and the Advisory Panel of Architects, Builders, Consultants, and Planners of School Facilities

Cluster		Sum of Squares	Degrees of Freedom	Mean Squared	F	p
Accessibility	Between Groups	.41	1	.41	.11	.74
	Within Groups	415.69	109	3.81		

	Total	416.11	110			
Waiting Area	Between Groups	22.07	1	22.07	5.98	.02*
	Within Groups	398.31	108	3.69		
	Total	420.38	109			
Nurseís Office	Between Groups	30.60	1	30.60	15.92	.00**
	Within Groups	209.53	109	1.92		
	Total	240.13	110			

Table 3 Continued

Analysis of Variance (ANOVA) for Design Cluster Variables Between Nurses and the Advisory Panel of Architects, Builders, Consultants, and Planners of School Facilities

Cluster		Sum of Squares	Degrees of Freedom	Mean Squared	F	p
Treatment Room	Between Groups	20.23	1	20.23	6.29	.01*
	Within Groups	347.19	108	3.22		
	Total	367.41	109			
Rest/Isolation Area	Between Groups	9.18	1	9.18	1.59	.21
	Within Groups	629.45	109	5.78		
	Total	638.63	110			
Restroom	Between Groups	.26	1	.26	.08	.79
	Within Groups	380.44	109	3.49		

	Total	380.70	110			

Table 3 Continued

Analysis of Variance (ANOVA) for Design Cluster Variables Between Nurses and the Advisory Panel of Architects, Builders, Consultants, and Planners of School Facilities

Cluster		Sum of Squares	Degrees of Freedom	Mean squared	F	p
Security, Storage, and Safety	Between Groups	6.46	1	6.46	1.99	.16
	Within Groups	354.22	109	3.25		
	Total	360.68	110			
Furnishings and Treatments	Between Groups	14.40	1	14.40	2.93	.09
	Within Groups	531.26	108	4.92		
	Total	545.66	109			

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

Regarding the cluster representing the waiting area (WAIT or statements 29 through 34) $F_{1,108} = 5.98$, $p \leq .02$. Nurses perceived these items to be significantly more important than did the advisory panel (Mean for Nurses = 6.34; Mean for Panel = 4.50). The cluster representing the nurseís office (NOFF or statements 35 through 50) $F_{1,109} = 15.92$, $p \leq .00$. Again, school nurses perceived these elements to be significantly more important than did the advisory panel (Mean for Nurses = 8.11; Mean for Panel = 5.95). Significance for the NOFF was at the $p < .01$ level. The cluster representing the treatment room (TRRM or statements 51 through 76) $F_{1,108} = 6.29$, $p \leq .01$. School nurses perceived these elements to be significantly more important than did the advisory panel (Mean for Nurses = 7.09; Mean for Panel = 5.33).

Analysis of Cluster Variables for a Specific Design Element

Statements for specific design elements were clustered and identified with abbreviations for reporting purposes. Twelve statements (variables 41, 42, 46, 62, 78, 80, 81, 85, 99, 103, 12, and 124) were clustered to represent lighting (LIGHTING) design elements. Window design (WINDOWS) contained four statements (variables 37, 38, 79, and 100). Three statements (variables 38, 79, and 80) represented integrating nature (NATURE) into the clinic design. Elements promoting a sense of well-being for users (WELLBE) had eight survey statements (variables 64, 65, 106, 108, 110, 128, 129, and 130). The cluster for use of color (COLOR) in a clinic design contained three statements (variables 43, 106, and 114). Privacy, space and confidentiality (PSC) elements in a clinic were the largest grouping of 11 statements (variables 63, 66, 68, 69, 82, 84, 97, 103, 108, and 110). Heating, venting and air conditioning (HVAC) had three statements (variables 38, 44, and 17). Electrical and plumbing elements (ELEPLU)involved 10 statements (variables 69, 70, 72, 73, 74, 75, 88, 89 105, and 119). Acoustic elements (ACOUS) had six statements (variables 48, 49, 86, 103, 104, and 131). Wall/ceiling elements (WALCEI) involved five statements (variables 39, 40, 43, 48, and 114). Specific flooring elements (FLOOR) were presented in three statements (variables 49, 107, and 115). Doors and wayfinding (DOORWA) elements were given in seven statements (variables 47, 51, 57, 58, 59, 98, and 127).

Table 4 provides the descriptive statistical data used for determining the difference between groups regarding the 12 specific design elements. The means and standard deviations for the perspectives of the two groups are presented. Group 1 identified the practicing school nurses, and Group 2 identified the advisory panel of architects, builders, consultants, and planners for school facilities.

Table 4 also displays the test for homogeneity of variances. Significance ($p < .05$) for the cluster LIGHTING and the cluster ELEPLU (electrical/ plumbing) was found. This significance indicated unequal variances between the mean scores for nurses and the advisory panel of architects, builders, consultants and planners for school facilities. Lighting and electrical/plumbing elements were not considered for further tests. The Leveneís score for the remaining clusters was non-significant indicating that the spread or variance of mean scores for the two groups was approximately equal.

Table 5 shows statistically significant differences ($p < .05$, $p < .01$) between the advisory panel and nurses on the following specific design clusters: windows (WINDOWS); integrating nature into design (NATURE); promoting a sense of well-being for the user (WELLBE); privacy, confidentiality, and security elements (PCS); and, heating, ventilation, and air conditioning (HVAC). Regarding the cluster representing

Table 4

Descriptive Statistics for Specific Design Elements

Cluster	Group	N	Mean	SD	Minimum	Maximum	Levene Statistic	Degrees of Freedom	Standardized Alpha
Lighting (LIGHTING)	1	64	6.52	1.83	1.75	10.00	4.44	1,67	.04
	2	5	4.62	.73	3.83	5.33			
	Total	69	6.38	1.84	1.75	10.00			
Windows (WINDOWS)	1	90	8.78	2.30	2.00	12.50	.08	1,95	.78
	2	7	6.32	1.95	3.50	8.50			
	Total	97	8.60	2.36	2.00	12.50			
Integrating Nature into Design (NATURE)	1	99	7.29	2.26	1.00	10.00	.09	1,104	.77
	2.	7	4.10	2.05	1.00	7.00			
	Total	106	7.08	2.37	1.00	10.00			

Table 4 Continued

Descriptive Statistics for Specific Design Elements

Cluster	Group	N	Mean	SD	Minimum	Maximum	Levene Statistic	Degrees of Freedom	Standardized Alpha
Promotion of a Sense of Well-Being (WELLBE)	1	90	6.91	1.83	1.25	10.00	.01	1,95	.93
	2	7	5.16	1.85	2.38	7.63			

	Total	97	6.78	1.88	1.25	10.00			
Privacy, Security and Confidentiality (PSC)	1	91	7.27	1.73	2.00	10.00	.15	1,96	.70
	2	7	5.09	1.58	3.55	7.64			
	Total	98	7.11	1.80	2.00	10.00			
Electrical and Plumbing (ELEPLU)	1	99	8.44	1.36	1.60	10.00	5.31	1,104	.02
	2	7	6.51	2.32	2.60	9.40			
	Total	106	8.31	1.50	1.60	10.00			

Table 4 Continued

Descriptive Statistics for Specific Design Elements

Cluster	Group	N	Mean	SD	Minimum	Maximum	Levene Statistic	Degrees of Freedom	Standardized Alpha
Doors and Wayfinding (DOORWA)	1	86	7.23	1.73	1.57	10.00	.10	1,91	.76
	2	7	6.51	1.58	4.00	8.57			
	Total	93	7.18	1.72	1.57	10.00			
Walls and Ceilings (WALLCEI)	1	84	7.03	1.87	2.40	10.00	3.27	1,88	.07
	2	6	7.77	1.05	6.20	9.20			
	Total	90	7.08	1.83	2.40	10.00			

Acoustics (ACOUS)	1	88	7.35	2.30	2.60	12.00	2.59	1,92	.11
	2	6	5.70	1.29	4.40	7.60			
	Total	94	7.25	2.28	2.60	12.00			

Table 4 Continued

Descriptive Statistics for Specific Design Elements

Cluster	Group	N	Mean	SD	Minimum	Maximum	Levene Statistic	Degrees of Freedom	Standardized Alpha
Color (COLOR)	1	94	6.88	1.99	1.67	10.00	.51	1,99	.48
	2	7	6.38	1.97	3.67	9.67			
	Total	101	6.84	1.99	1.67	10.00			
Heating, Ventilation and Air Conditioning (HVAC)	1	99	8.15	1.99	1.00	10.00	2.58	1,104	.11
	2	7	6.10	.79	4.67	6.67			
	Total	106	8.02	2.00	1.00	10.00			
Flooring (FLOOR)	1	94	6.27	1.87	1.33	10.00	1.53	1,99	.22
	2	7	5.57	1.34	3.67	7.67			
	Total	101	6.22	1.84	1.33	10.00			

Table 5

Analysis of Variance (ANOVA) for Specific Design Cluster Variables Between Nurses and the Advisory Panel of Architects, Builders, Consultants, and Planners of School Facilities

Cluster		Sum of Squares	Degrees of Freedom	Mean Squared	F	P
Windows (WINDOWS)	Between Groups	39.19	1	39.19	7.54	.01**
	Within Groups	493.52	95	5.20		
	Total	532.71	96			
Integrating Nature Elements into Design (NATURE)	Between Groups	66.85	1	66.85	13.23	.00**
	Within Groups	525.33	104	5.05		
	Total	592.18	105			

Table 5 Continued

Analysis of Variance (ANOVA) for Specific Design Cluster Variables Between Nurses and the Advisory Panel of Architects, Builders, Consultants, and Planners of School Facilities

Cluster		Sum of Squares	Degrees of Freedom	Mean Squared	F	p
Promoting a Sense of Well-being (WELLBE)	Between Groups	19.81	1	19.81	5.91	.02*
	Within Groups	318.35	95	3.35		
	Total	338.16	96			
Privacy, Security and Confidentiality (PSC)	Between Groups	30.74	1	30.74	10.39	.00**

Within Groups	284.02	96	2.96	
Total	314.76	97		

Table 5 Continued

Analysis of Variance (ANOVA) for Specific Design Cluster Variables Between Nurses and the Advisory Panel of Architects, Builders, Consultants, and Planners of School Facilities

Cluster		Sum of Squares	Degrees of Freedom	Mean Squared	F	p
Doors and Wayfinding (DOORWA)	Between Groups	3.38	1	3.38	1.14	29
	Within Groups	269.80	91	2.97		
	Total	273.17	92			
Walls and Ceilings (WALLCEI)	Between Groups	3.05	1	3.05	.91	.34
	Within Groups	295.17	88	3.35		
	Total	298.22	89			
Acoustics (ACOUS)	Between Groups	15.33	1	15.33	3.01	.09
	Within Groups	468.22	92	5.09		

	Total	483.56	93			

Table 5 Continued

Analysis of Variance (ANOVA) for Specific Design Cluster Variables Between Nurses and the Advisory Panel of Architects, Builders, Consultants, and Planners of School Facilities

Cluster		Sum of Squares	Degrees of Freedom	Mean Squared	F	p
Color (COLOR)	Between Groups	1.62	1	1.62	.41	.53
	Within Groups	394.51	99	3.99		
	Total	396.13	100			
Heating, Ventilation and Air Conditioning (HVAC)	Between Groups	27.64	1	27.64	7.28	.01**
	Within Groups	394.89	104	3.80		
	Total	422.53	105			
Flooring (FLOOR)	Between Groups	3.14	1	3.14	.93	.34
	Within Groups	336.29	99	3.40		
	Total	339.43	100			

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

windows (WINDOWS) $F_{1,95} = 7.54$, $p \leq .01$. Nurses perceived this element to be significantly more important than did the advisory panel (Mean for Nurses = 8.78; Mean for Panel = 6.32). The cluster adding nature elements into clinic design (NATURE) $F_{1,104} = 13.23$, $p \leq .00$. Again, nurses perceived this design element significantly more important than the advisory panel did (Mean for Nurses = 7.29; Mean for Panel = 4.10). For the cluster of design items that promoted a sense of well-being for clinic users (WELLBE) $F_{1,95} = 5.91$, $p \leq .02$. Practicing school nurses perceived these items significantly more important than the advisory panel did (Mean for Nurses = 6.91; Mean for Panel = 5.16).

Privacy, security, and confidentiality (PSC) design elements had an $F_{1,96} = 10.39$, $p \leq .00$. Nurses perceived these item significantly more important that the advisory panel did (Mean for Nurses= 7.27; Mean for Panel = 5.09). The last design element that showed a statistically significant difference between the advisory panel and nurses was heating, ventilation, and air conditioning statements (HVAC) with an $F_{1,104} = 7.28$, $p \leq .01$. Practicing nurses perceived this design element significantly more important that the panel did (Mean for Nurses = 8.15; Mean for Panel = 6.10).

Demographics of Respondents

Twelve surveys were sent to the selected panel of experts. Seven surveys were returned. All respondents to the clinic design survey for the advisory panel group were males and included two architects, a builder, two facilities planners, and two Georgia Department of Education facilities consultants. All panel members were actively designing, constructing, or managing new construction or renovation of schools.

Surveys were given to 110 school nurses at the annual conference with 100 surveys completed and returned to the researcher. Four practicing school nurses completed the survey before the conference .All 104 respondents were females who were practicing nurses in schools.

A coded demographic sheet is shown in Appendix C. Demographic data for occupation, age, ethnicity, marital status, income, years as a nurse, years as a school nurse and educational degree are reported in Appendix D. Data for work setting, hours worked, size of school, and availability of clinic or nurseís office were inconsistent or not completed for all 104 respondents. For gathered data, the researcher for reporting purposes tabulated frequencies and percents.

Of the 104 school nurse surveys, 72 respondents (69%) worked in a school setting including an elementary school. Of these 72 respondents, 49 nurses (68%) worked in an elementary school only. The remaining 23 respondents (32%) worked in a combination setting of elementary/ middle school, elementary/high school, or elementary/middle school/high school.

School setting choices were rural, suburban, or inner-city. For nurses (72) that worked in an elementary school, 32 respondents (44%) worked

in a rural setting, 18 respondents (25%) worked in a suburban setting, 15 respondents (21%) worked in an inner-city setting, and seven nurses (10%) did not respond to the question.

The number of hours worked for all practitioners ranged from eight hours per week or part-time employment to 40 hours per week or full time employment. Data for the size of the school setting and the setting having a clinic or nurseís office were not tabulated due to lack of responses or incomplete responses.

CHAPTER 5

SUMMARY, RECOMMENDATIONS, AND IMPLICATIONS

This chapter presents a summary of the study and reviews the findings of the research. The chapter concludes with recommendations for enhancing or adding health clinics to elementary schools in the state of Georgia, and implications for further research.

Summary of the Study

Schools seem to be the logical place to serve the health care needs of students and to provide access to the health services, since students are located in schools for a majority of each day. The school becomes the link between education, health, social services, and other support services that children and families need. Existing federal legislation mandated that health services be provided for children with disabilities and health problems (American with Disabilities Act, 1990; Individuals with Disabilities Education Act, 1990, & Amendments, 1997; Section 504 of the Rehabilitation Act, 1973).

The literature suggested that the physical and psychological health of children had a direct impact on their academic and social development in school (Bush, 1997; Dryfoos, 1997; Hacker & Wessel, 1998; Jang, 1994; Morgan, 1987; Ouellette, 2001; Passerelli, 1994; Symons, et al., 1997; Tyson, 1999). School nurses were key players in the delivery of health services in the school setting, but inadequate conditions and facilities in public schools were problems for nurses. Clinic design standards were not available for Georgia schools. This study suggested that the planners and users of a facility have expertise to offer regarding facility needs; hence, it provided professional school nurses, as well as architects, builders, consultants, and planners of school facilities an opportunity to express their ideas about their facility needs.

Clustered Design Elements

Based on the review of the literature and the perceptions indicated by a panel of experts and by practicing school nurses who participated in this study, clustered design elements and specific design elements were identified for the health clinic. All of the clustered design elements were perceived as having at least a medium degree of importance to clinic design.

An office for the nurse, a treatment room, a waiting area, a rest area, and a restroom were identified in the literature review as necessary components or rooms of the health clinic (Hawkins & Lilley, 1998; Hubler, 1996; McKibben & DiPaolo, 1997; Perkins, 2001). Size and space requirements varied in the literature, but the size of the clinic should be determined by the use and primary purpose of the clinic (Jelliffe & Schipp, 2002; Johnston, 1977). The components, size and space elements were viewed as the most important design element by all respondents to the survey; however, nurses perceived these elements to be more important than did the advisory panel of architects, builders, consultants, and planners of school facilities.

Practicing nurses, or practitioners, perceived three additional design elements more important than the advisory panel did: (a) the waiting area cluster, (b) the nurseís office cluster, and (c) the treatment room cluster. These three design elements directly impact the performance of needed services by nurses for users of the clinic. The literature review revealed that the nurseís responsibilities and duties, the types of procedures to be performed, plus the needs and ages of the students who will be using the spaces should determine design needs (Butin, 2000; Frasca-Bellieu, 1999; Johnston, 1977; Ulrich, 1990).

Having an isolation room or separate rest area in the clinic received the lowest score from all respondents, but was rated as of medium importance overall. The advisory panel noted in the comment section for this design element on the survey that providing a separate rest/ isolation area in an elementary clinic was not cost effective. Architects, builders, consultants, and planners perceived the rest/isolation area as a dedicated area in the nurseís office or treatment area rather than a separate room. This perception differed from the review of the literature which recommended a separate room (Castaldi, 1994; Chaney, 1973; Davini, 1952; Hawkins & Lilley, 1998; Jelliffe & Schipp, 2002; Medical Center of Georgia, 2000; Perkins, 2001).

As reported in the review of literature, consideration for the location and accessibility of the clinic must be given in relation to the location of the administrative offices, the playground, and access for medical emergency vehicles (Butin, 2001; Carpman, Grant, & Simmons, 1986; Castaldi, 1994; Hawkins & Lilley, 1998; Hubler, 1996; Krent, Cairns, & Dodge, 1993; Jelliffe & Schipp, 2002; McKibben & DiPaolo, 1997; Perkins, 2001). The advisory panel and the school nurses agreed with the literatureís view on this design element.

The remaining design clusters received similar scores from nurse and advisory panel respondents: (a) the restroom (toilet); (b) security,

storage, and safety features; and (c) furnishing and treatments. Access to a restroom (toilet) was important to nurses as noted in comments for this section of the survey. Both groups commented that the restroom design with a shower and washer/dryer area were ideal but having access to a sink with hot and cold running water in the clinic was more important. The advisory panel and the school nurses agreed that having safe, secure storage for medical files and medications was important. All respondents gave a low degree of importance for the use of a music system as a necessary furnishing in the clinic.

Specific Design Elements

The specific design elements identified in the review of the literature were: (a) lighting and daylighting elements; (b) window elements; (c) integrating nature elements into design; (d) promoting a sense of well-being for the users; (e) privacy, space, and confidentiality elements; (f) electrical and plumbing elements; (g) doors and wayfinding elements; (h) walls and ceilings; (i) acoustics; (j) color; (k) heating, ventilation, and air conditioning elements; and (l) flooring elements (AIA, 1987; Butin, 2000; *Floor Plan,* 2003; Frasca-Bellieu, 1999; Gappell, 1991; Center for Health and Health Care in Schools, 2004a & b; Johnston, 1977; Malkin, 1990; Ulrich, 1990). Clusters of survey statements were grouped to provide data for analysis.

Automatic emergency lighting, use of indirect lighting close to natural sunlight, and use of a portable high intensity light received moderately high scores from all respondents in the item analysis. The use of light close to natural sunlight was supported by the review of literature (Boyce, 1981; Gappell, 1991; Hathaway, 1994; Tanner, 2000; Torrice, 1988). The remainder of the lighting statements were scored in the medium importance range except for the use of a light fixture with a dimmer over a cot. While the literature supported the use of dimmers and controls for lighting in the clinic, the statement concerning the use of a dimmer in the rest area was rated moderately low for importance for all respondents.

The use of windows in the clinic was supported in the review of the literature (Carpman et al., 1986; Gappell, 1991; Malkin, 1990; McKibben & DiPaolo, 1997; Ulrich, 1990). Respondents in the item analysis scored windows used between rooms to provide supervision and to provide natural light and ventilation as a moderately high level of importance to clinic design. Practicing school nurses perceived the window element cluster more important to clinic design than the advisory panel did.

Lighting and window elements were used to represent elements that integrated nature into design. The literature supported design that brought the outdoors into facilities (Pinto, 1996; Renzi, 2001; Ulrich, 1990) to reduce stress and promote recovery. The use of windows to provide

natural light and views of natureótrees, plants, wateró as well as indirect lighting close to natural sunlight were rated medium to moderately high in importance to clinic design by all respondents in the item analysis. In the analysis between groups, the advisory panel did not perceive this element to be as important as practicing nurses did.

Promotion of a sense of well-being for users encompassed the use of furniture, wall coverings, artwork that reflected specific populations and cultures, and design that fosters a sense of control for users (Carpman et al., 1986; Kantrowitz & Associates, 1993; Simeonova, 2003). Again, practicing nurses perceived this cluster of statements to be more important to clinic design than the advisory panel did.

Color elementsólight paint colors; washable, semi-gloss paint; and contrasting colors on walls and baseboardsówere suggested in the literature review (Carpman et al., 1986; Day, 1980; Rouk, 1997; Smith, 1980). All respondents rated these elements in the medium to moderately high range of importance to clinic design in the item analysis. The difference in perceptions between the groups was not significant.

Nurses and the advisory panel perceived privacy, space and confidentiality elements differently. Nurses responded that having separate rooms, use of curtains to separate patients, use of movable partitions, and access to telephones, intercoms, and other communication equipment in the clinic were of moderately high importance to the design of the clinic. Architects, builders, consultants, and planners of school facilities rated these elements as of medium importance. The review of the literature revealed that ample space and added privacy reduced tension and stress for users (Butin, 2000; Carpman et al., 1986; Frasca-Beaulieu, 1999; Gappell, 1991).

In the area of heating, ventilation, and air conditioning the two groups responded differently on the importance of these elements. Nurses perceived windows for ventilation, having a set of controls for the clinic, and ventilation for the bathroom more important to clinic design that the advisory panel did. Again, the literature review reported that control of the thermal environment in a building was important to the occupants (Day, 1980; Center for Health and Health Care in Schools, 2001). Optimal temperatures as well as correct moisture, dryness, and movement of air were necessary for performance of tasks (Day, 1980).

Several statements concerning electrical and plumbing elements were scored very high for importance on the item analysis. Having a sink with hot and cold water, having a refrigerator/freezer, and having connections for phones, fax, computers and modems were rated as very high in importance to clinic design. The review of the literature supported the item analysis scores (Hawkins & Lilley, 1998; Center for Health and Health Care in Schools, 2004b). However, the cluster of variables used for this design element was found to lack homogeneity so the design element was not used for further tests between groups.

Acoustic elements were revealed in the review of the literature. Noise in a healthcare facility produced stress and changes in blood flow in

patients and staff, and decreased productivity of staff (Frasca-Beaulieu, 1999; Gappell, 1991; Rouk, 1997). Separate ceilings, carpeting, movable partitions, and other acoustical treatments were recommended (Day, 1980; Johnson, 2001; Lyons, 2002; Malkin, 1990). All respondents on the item analysis rated locating the treatment room away from phones moderately high. The difference in perceptions of the two groups for this cluster of variables was not significant.

The review of the literature reported that separate ceilings for rooms, light paint colors for walls, epoxy paint, and smooth, moisture resistant surfaces for walls and ceilings were recommended (AIA, 1987; Alexander, 1972; Malkin, 1990; Noskin & Peterson, 2001). Item analysis revealed that respondents agreed with the literature since all variables were rated medium to moderately high in importance to clinic design. Differences between groups of respondents were insignificant.

All respondents rated the use of carpeting in clinic design as moderately low in importance. The literature review showed that carpeting received mixed reviews from researchers (Carpman et al., 1986; Day, 1980; McKibben & DiPaolo, 1997; Simmons, Reizenstein, and Grant, 1982). Vinyl composition tile, seamless resilient flooring and ceramic tiles received recommendations from the literature review (All in a Dayís Work, 1999; AIA, 1987; Jelliffe & Schipp, 2002; Malkin, 1990; McKibben & DiPaolo, 1887). Both groups had similar ratings for this design cluster, so differences between groups were not significant.

In the area of doors and wayfinding elements for clinic design, all respondents scored doors wide enough for emergency equipment as very high in importance on the item analysis. Scores between groups were similar and not significant. The findings of the literature review were in agreement with the respondentsí ratings for use of solid core doors, using signage to mark the way to the clinic, and using safety glass in doors (AIA, 1987; Frasca-Beaulieu, 1999; Kennedy, 2002b; Malkin, 1990).

Comment and concern sections on the survey reflected enumeration of the areas included in the survey. The most often occurring responses centered on issues that the survey statements reflected an ideal clinic in an elementary school. Architects, builders, consultants, and planners commented that many of the design statements were not cost effective. Nurse comments were that every statement on the survey was ideal, but many of the statements were necessary design elements or characteristics needed to perform their tasks. The findings reported in the data analysis were supported by the literature review.

Recommendations

The literature review shows that the school continues to be an efficient site for health care delivery for students with special needs and removes

some barriers for students needing access to health care. The role and the responsibilities of the school nurse continue to be dependent on the needs of the student served and the availability of funding sources of the community and local board of education. Clinics in elementary schools should be designed to support the school nurse in meeting the needs of the students being served. The following recommendations are presented for planning and designing health clinics in elementary schools:

1. The Department of Education in the state of Georgia should write facility guidelines for health clinics in elementary schools. The guidelines issued by the Department of Education in Maryland could be used as a starting point for those in Georgia.
2. The professional judgment of school nurses should be considered when establishing facility guidelines. Their perceptions in this study correlated with the concepts presented in the review of literature.
3. The school nurse and representatives of the students, parents, and school staff who will be using the health clinic should be involved in the planning and designing of the facility.
4. The finding in each of the areas of this study should be considered while establishing guidelines in the state of Georgia.

Implications for Further Research

While collecting data at the Georgia Association of School Nursesí conference, attendees expressed a strong interest in the survey and asked that the results of the survey be presented to their organization. It is recommended that similar studies be conducted concentrating on the middle school and high school level so that facility guidelines can be established that address the individual uses of health clinics in different levels of educational facilities.

The unequal numbers in the groups of nurse respondents compared to the number of respondents for the advisory panel should be noted. Future researchers should attempt to achieve equity in the number of respondents for the selected groups.

In addition, the review of the literature revealed the growing trend of more medically fragile students attending schools, more medications being given at school, and more students coming to school needing medical attention. The literature suggested that the physical and psychological health of children had a direct impact on their academic and social development in school (Bush, 1997; Hacker & Wessel, 1998; Jang, 1994; Morgan, 1987; Ouellette, 2001; Passerelli, 1994; Symons, et al., 1997; Tyson, 1999). Guidelines are needed to aid in designing health clinics in elementary schools to meet the needs of the students being served.

APPENDIX A: LITERATURE REVIEW TABLE

Design Element: **Lighting**	**Source:**
Lighting affected human ability to see and work effectively.	Day,1980; Gappell, 1991; Grocoff, 1995
Warm fluorescent or incandescent light provided more home-like atmosphere.	Alexander, 1972; Birren, 1979; Carpman, Grant, & Simmons, 1986; Rosenfield, 1972
High CRI lights needed to judge color correctly.	Boyce, 1981
Full-spectrum lighting that comes close to natural sunlight recommended.	Torrice, 1988
Compact fluorescent or halogen lamps needed for task lighting.	Moscher, 2003
Indirect lighting needed for work areas.	Rosenfeld, 1971
Dimmers for control of lighting in medical settings recommended.	Center for Health in Schools, 2004; Malkin, 1990; Rosenfeld,1971; Veitch & Newsham, 1996
Natural light from windows, skylights, suntubes, and atriums recommended.	American Institute of Architects (AIA), 1987; Grocoff ,1995; Hathaway, 1994; Heschong Malone Group, 2001; Payne, 2000; Tanner, 2000
Design Element: **Windows**	**Source:**
Windows admitted light, permitted ventilation, and framed a view.	Alexander,1972
Brightness control needed for windows.	Dorsey,1980
Windows associated with thermal, visual, and psychological aspects of comfort. Light and views from windows associated with relaxation and faster healing.	Carpman, Grant, & Simmons, 1986; Gappell, 1991; Ulrich, 1990
Windows started 42 inches off the floor so cabinets can be placed under them.	Malkin, 1990

Windows recommended between the office area, rest area for ill students, and waiting area for the clinic to allow for supervision of students by the office staff when the nurse was not present.	Carpman, Grant, & Simmons, 1986
Outside window or skylight needed for lighting and ventilation.	McKibben & DiPaolo, 1997

Design Element: **Nature**	**Source:**
Outdoors integrated into facilities.	Pinto, 1996
Designs lack heavy detailing. Everything is quite subtle and informal.	Renzi, 2001
Positive distractionsóhappy and caring faces, pets or unthreatening animals, and nature elements like trees, plants, and wateróused.	Ulrich , 1990
Design Element: **Sense of Well-Being**	**Source:**
Physical and social surroundings influenced health.	Frasca-Bellieu, 1999
A relaxing or soothing atmosphere promoted quicker recovery and healing.	Croswell, 2000
Soft lighting environments were best for mental tasks.	Day, 1980
Indirect lighting, upholstered furniture, magazines and access to nature through windows or artwork softened the room and relaxed the patient.	Carpman, Grant, & Simmons, 1986
Feng shui principles used. Exam rooms faced the north side of the building, Administration offices were on the south side of the building.	Renzi, 2001
Spaces were comfortable, light, and welcoming.	Kantrowitz & Associates, 1993
Privacy and abundant natural light provided.	Kantrowitz & Associates, 1993

There was integration between lighting and an array of auditory, fragrance, and other sensory experiences.	Simeonova, 2003
Aquariums, interactive water fountains, light hardwood paneling, outdoor views, and original artwork used.	Croswell, 2000
Floral arrangements and bowls of sachet used.	Gappell, 1991
Design Element: **Color**	**Source:**
Lighting influenced colors of a room.	Dorsey, 1980; Malkin, 1990; Rosenfield, 1972
No specific guidelines to color selections existed for an ACF (Ambulatory Care Facility).	Frasca-Beaulieu, 1999
Color influenced human emotions and physiology.	Alexander, 1972; Chaney, 1973; Day, 1980; Dorsey, 1980; Malkin, 1990

Red, orange and pink colors stimulated the sympathetic nervous system, increased brain wave activity, and sent blood to the muscles, accelerating heart rate, blood pressure, and respiration.	Alexander, 1972; Birren, 1979; Burr, 2000; Chaney, 1973; Dorsey, 1980; Malkin, 1990; Rosenfield, 1972
Blue and green colors triggered the parasympathetic nervous system and had a tranquilizing effect.	Alexander, 1972; Birren, 1979
Warm colors seemed to advance. Cool colors seemed to recede.	Chaney, 1973; Rouk, 1997).
Cool colors caused participants to underestimate time, weight, and size. Warm colors produced the opposite effect.	Chaney, 1973; Day, 1980; Malkin, 1990
Choice of color depended upon the source of light, the size, location and shape of the space, the number of occupants, and the use of the space.	Birren, 1979; Gappell, 1991; Rice, 1953; Smith, 1980
Lighter colors had higher reflective values	Day, 1980
Contrasting color values used especially in flooring, baseboards, and walls.	Carpman, Grant, & Simmons, 1986

Painting one wall a different color reduced monotony and relaxed the eyes.	Rouk, 1997
A variety of colors and shades used to provide needed interest and stimulation, to increase heart and breathing ratios, and to affect the cortex of the brain.	Birren, 1979; Gappell, 1991
Light salmon, warm yellow, pale yellow or orange recommended in elementary schools.	Rouk, 1997; Smith, 1980
Design Element: **Privacy, Space, Confidentiality**	**Source:**
Visual privacy, acoustical privacy, social contact, and solitude provided by design. î	Carpman, Grant, & Simmons, 1986
Ample space and added privacy provided to avoid tension and stress.	Gappell, 1991; Frasca-Beaulieu, 1999
Privacy for communication (phone conversations, fax transmissions, patient/ nurse conversations) increased by reducing noise.	Butin, 2000; Carpman, Grant, & Simmons, 1986
Privacy for communication increased by spatially arranging furniture.	Butin, 2000; Carpman, Grant, & Simmons, 1986
Location of phones, computers, faxes, and intercoms in areas with acoustic controls provided.	Butin, 2000; Carpman, Grant, & Simmons, 1986
Exam rooms had movable walls, cubicle curtains, or partitions.	Butin, 2000; Carpman, Grant, & Simmons, 1986
Areas for ill students physically separated from the rest of the nurseís office.	Butin, 2000; Carpman, Grant, & Simmons, 1986
Design Element: **Heating, Ventilation, Air Conditioning**	**Source:**
Use of windows for ventilation and lighting reduced heat gain.	American Institute of Architects, 1987
Health room/clinic had a separate control that was operated outside of school hours if necessary.	Health in Schools, 2001

Optimal temperatures as well as correct moisture, dryness, and movement of air were necessary for effective learning or performance of tasks.	Day, 1980
Air quality and thermal comfort were perceived through the skin.	Gappell, 1991
Indoor irritants and indoor air pollution were adverse environmental conditions in schools.	Lyons, 2002
Faulty room temperatures and poor air circulation caused by poor design, inadequate maintenance, and inefficient and outdated heating, ventilation, and air-conditioning systems in schools.	Lyons, 2002
Asthma, drowsiness, lethargy, and the inability to concentrate linked to indoor air pollution and indoor irritants	EPA, 2004; Lara, et al., 2002
Ordinary houseplants effective in removing toxic pollutantsóformaldehyde, benzene, and trichloroethylene-- from air inside buildings.	Gappell, 1991
Design Element: **Electrical and Plumbing Needs**	**Source:**
Outlets provided in all spaces as required by code.	AIA, 1987
Automatic emergency lighting provided for safe egress from the building in event of a power failure.	AIA, 1987
A fire alarm system installed.	AIA, 1987
Dimmer switches placed on lights.	Center for Health in Schools, 2004b
Electrical circuit for the refrigerator and the ice machine active at all times.	Center for Health in Schools, 2004b
Schoolís intercom system was available to clinic staff.	Center for Health in Schools, 2004b
Additional outlets, seating, and counter spaces provided for students to use personal nebulizers.	McKibben & DiPaolo, 1997
12 accessible outlets provided throughout the nurseís office and the bathroom area.	McKibben & DiPaolo, 1997

Sinks in exam rooms or patient areas equipped with single lever blade handles.	AIA, 1987
Enclosing plumbing pipes behind a false wall created a smooth hard surface easier to clean.	Leckie, 1999
Pipe penetrations and joints were tightly sealed to prevent or minimize entry of rodents or insects.	AIA, 1987; Noskin & Peterson, 2001
Shower space provided in the clinic to accommodate students with special needs. A sink provided in the treatment area and in the restroom.	Jelliffe & Schipp, 2002
Eye wash located on the sink in the treatment area.	McKibben & DiPaolo, 1997
Design Element: **Acoustics**	**Source:**
Noise in a healthcare facility produced a generalized stress reaction.	Gappell, 1991; Rouk, 1997
Rhythmic and soothing music in the healthcare environment controlled heart rate, lowered blood pressure, and masked normal conversation.	Frasca-Beaulieu, 1999; Malkin, 1990
Sound of bubbling water in a fish tank provided distractions from noise and reduced restlessness in children.	Frasca-Beaulieu, 1999
Sound control was important in examination room.	Malkin, 1990
Carpet, wall coverings, draperies and acoustic ceiling tiles used.	Malkin, 1990
Solid-core doors used.	Malkin, 1990
Fiberglas batting used inside walls.	Malkin, 1990
ìAcoustical holesî created by pocket doors, electrical outlets, plumbing pipes, and heating ducts avoided.	Malkin, 1990
A separate ceiling for each room provided.	Malkin, 1990
Special attention provided for rooms for hearing tests.	Malkin, 1990

Noise affected elementary students more because children did not discriminate sounds from background noise until the teen years.	Lyons, 2002
Acoustic liners installed in ductwork for HVAC systems. Melamine foam liners preferred--did not contribute to indoor air pollution and did resist fungal and microbial growth.	Johnson, 2001
False ceilings avoided in high risk areas because this type of ceiling harbored dust and pests that contaminated the health care environment if the ceiling was disturbed.	Noskin & Peterson, 2001
Design Element: **Walls and Ceilings**	**Source:**
High-density vinyl barriers installed inside walls and vinyl barriers above suspended ceilings as well as foam sound absorbing panels on walls and on ceilings to stop noise and aid in acoustical control.	Johnson, 2001

Light paint colors used on walls and ceilings to make rooms look larger. Gloss or semi gloss paint that withstands washing with modern cleaning products used.	Alexander, 1972
Epoxy paint used for concrete block walls.	Jelliffe & Schipp, 2002
Walls and ceilings had smooth and moisture resistant surface that was easy to clean with minimal likelihood of dust accumulation.	AIA, 1987; Noskin & Peterson, 2001
Vinyl or woven wall coverings used that were mildew resistant and can be cleaned with bleach.	Malkin, 1990
Stucco and sand-finished textured walls not used because these finishes collected dirt and were difficult to clean.	Malkin, 1990
Paneling and fabric wall coverings used for waiting areas.	Malkin, 1990

Minimum ceiling heights of seven feet 10 inches or 2.38 meters were used.	AIA, 1987
Suspended acoustic tile ceiling installed to allow access to electrical and mechanical equipment.	Malkin, 1990
Acoustical tiles avoided in high risk areas because these tiles supported microbial growth when wet.	Noskin & Peterson, 2001
Plastic or vinyl-coated acoustic ceiling tiles recommended for areas where sanitation was important since this type of tile was easy to clean and minimized bacterial growth.	Jelliffe & Schipp, 2002
Staggered ceiling planes and indirect lighting used to give the illusion of natural light.	Croswell, 2000
Design Element: **Flooring**	**Source:**
Temperature in a building was easier to control and less costly to maintain when carpet used on floor surfaces.	Day, 1980
Low-pile carpet without a pad was functional in a healthcare facility if it did not impede handicapped users, and carpeting accentuated noise control.	Simmons, Reizenstein, & Grant, 1982
Carpeting installed for hallways.	Carpman, Grant & Simmons, 1986
Carpeting used in the nurseís private office.	McKibben & DiPaolo, 1997
Four types of flooring used for medical facilities: carpet, vinyl composition tile (VCT), sheet vinyl, and ceramic tile.	Malkin, 1990
Floor coverings for medical facilities met stringent healthcare codes such as infection control and fireproofing.	Fogarty, 1998
Carpets recommended were 100% solution-dyed nylon with a solid vinyl backing and mechanically welded seams that formed a moisture-tight, hygienic floor covering.	Fogarty, 1998

Ceramic tile recommended for wet areas. Sheet vinyl was less expensive, had fewer seams, and provided a self-coved base.	AIA, 1987; All in a Dayís Work, 1999; Malkin, 1990
Clinic area flooring had a nonslip surface, was durable, had antibacterial properties or was not affected by germicidal or cleaning solutions, was easy to clean and maintain, and had attractive patterns and colors.	AIA, 1987; Designer Floors, 2000; Jelliffe & Schipp, 2002; McKibben & DiPaolo, 1997
Natural materials and replenished or recycled products (such as vegetable-dyed wool, cork, and wood fiber acoustical tiles or concrete, limestone, and linoleum floors) used in flooring.	Burr & Sullivan, 2000; Renzi, 2001
Design Element: **Doors**	**Source:**
Folding or pocket doors suggested to provide flexibility in school settings.	Alexander, 1972
Use of pocket doors discouraged for privacy issues. Solid core doors recommended.	Malkin, 1990
Doors were durable to withstand use by children, and doors met federal accessibility guidelines and local fire/building codes.	Kennedy, 2002b
Minimum door width of 2 feet 10 inches or 86 cm recommended for patient use, and flush threshold and expansion joints recommended facilitating use of wheelchairs, carts and stretchers in the clinic area.	AIA, 1987
Design Element: **Wayfinding**	**Source:**
Wayfinding elements included special lighting, use of different colors on walls, special artwork, signage, and/or furniture.	Frasca-Bellieu, 1999
Patterning and designs in flooring added to the well-being of patients and aided in wayfinding.	Burr & Sullivan, 2000; Designer Floors, 2000
Design Element: **Components, Size and Space Requirements**	**Source:**

Space requirements were determined by staffing requirements and the primary purpose and use of the space.	Johnston, 1977
Health center included an office for the nurse, storage space for student records, beds for ill students, a bathroom, and appropriate space for vision and hearing testing.	Hubler, 1996
Guidelines for an elementary school nurseís office varied from 200 to 500 square feet.	CEFPI, 1991; Jelliffe & Schipp, 2002
A minimum of 650 square feet of office space and a bathroom with approximately 130 square feet were recommended.	McKibben & DiPaolo, 1997
The nurseís office was divided into four areas: (a) a waiting /rest area; (b) a treatment area for injuries and medications; (c) a privacy/conference/isolation area; and (d) a bathroom area.	McKibben & DiPaolo, 1997
Design Element: **Location**	**Source:**
Health center located with an adjacent public parking area with outdoor lighting.	Center for Health in Schools, 2004a
Signage marked the way and entrance to the health center.	Center for Health in Schools, 2004a
Medical emergency vehicles had access to the health center.	Center for Health in Schools, 2004a
Health center easily closed off from the remainder of the school without affecting restroom use or external access.	Center for Health in Schools, 2004a
Nurseís office was located near the administrative offices.	Butin, 2001;Castaldi, 1994; Hawkins & Lilley, 1998; Hubler, 1996; Jelliffe & Schipp, 2002; McKibben & DiPaolo, 1997; Perkins, 2001
Placing the guidance suite next to the clinic provided effective use of a shared conference room.	Jelliffe & Schipp, 2002; McKibben & DiPaolo, 1997,

The locations of playgrounds and clinics were considered at the elementary school level.	Jelliffe & Schipp, 2002
Design Element: **Accessibility**	**Source:**
Federal requirements for accessibility required with renovation of existing buildings and with new buildings.	Bar & Galluzzo, 1999; Krent, Cairns, & Dodge, 1993
Stringent requirements for making buildings accessible to persons with disabilities applied. All buildings met very specific and extensive design standards.	Uniform Federal Accessibilities Standards (UFAS), 1984; American with Disabilities Act Accessibility Guidelines for Buildings and Facilities , 2002
Doors were wide enough for a stretcher and ample spaces for wheelchairs and other emergency equipment allocated.	Johnston, 1977; Carpman, Grant & Simmons, 1986
Design Element: **Waiting Area**	**Source:**
Waiting area located away from general corridors.	Butin, 2001
The waiting area was large enough to separate patients, was attractive, and provided seating that was firm and stable.	Johnston, 1977
Gold, blue, and terra cotta colors were recommended in the waiting area.	Chaney, 1973
Seating had individual armrests to assist patients in sitting down and rising and provided a sense of separation from the next person.	Carpman, Grant, & Simmons, 1986
Two exits provided in the clinic space: from a main corridor for the student and parent and through the office.	AIA, 1987; Jelliffe & Schipp, 2002
Minimum width for the main corridor was 5 feet or 1.52 meters.	AIA, 1987
Wall mounted lighting with 20 foot-candles of illumination was provided.	Malkin, 1990

Design Element; **Nurseís Office/Station**	**Source:**
Light colors in cool or warm colors and bright accents in the nurseís area provided.	Davini, 1952
Pumpkin color for the nurseís station suggested.	Chaney, 1973
A work counter, communication system, provisions for charting patients, and a space for needed supplies provided in the nurseís station.	AIA, 1987
The nurseís office was equipped with access to an intercom, cable connections for a telephone, fax and computer, modem access to the Internet, and electrical connections to support a computer and other needed equipment.	Butin, 2000
Built-in fluorescent lighting for the medicine cabinet at the nurseís station provided.	Rosenfeld, 1971
A drug distribution area was part of the nurseís station.	AIA, 1987
Nurseís station was equipped with a work counter, sink, refrigerator, and locked storage for biologicals and drugs.	AIA, 1987
A maintained illumination of 100 foot-candles for the nurseís station provided.	Malkin, 1990
Indirect lighting was used in the nurseís station.	Grocoff, 1995
Recessed 2 X 2 pendants recommended around computers.	Rouk, 1997; Mosher, 2003
Nurseís station had a cot for every 300 students and had chairs for students waiting for treatment.	McKibben & DiPaolo, 1997
The privacy area, an enclosed multipurpose area that had a cot for isolating a student, a chair, telephone or telephone jack, should have a window that provides a view out of and into this room.	McKibben & DiPaolo, 1997

A desk placed in either the waiting area or privacy area could serve as the office area for the nurse.	McKibben & DiPaolo, 1997
The nurseís office had its own set of controls for heating and air conditioning.	McKibben & DiPaolo, 1997
Design Element: **Examination/Treatment Room**	**Source:**
Exam room located away from corridors and phone/work areas to minimize noise and to facilitate hearing tests.	Butin, 2000
A minimum of 80 square feet for the exam room provided.	AIA, 1987
If the exam room and office area were combined then the room should be at least 120 sq. ft. to provide adequate office and exam space	Johnston, 1977
The examination room was at least 22 feet long.	Butin, 2000; Center for Health in Schools, 2004
Artificial light with special attention given to the lighting and ballasts was selected for the space used for vision and hearing testing.	Butin, 2000; Center for Health in Schools, 2004
A corridor at least 20 feet in length could serve for vision testing and a small 8x8 foot sound-proofed space could serve as a hearing test room.	Malkin, 1990
The exam room was painted in light tones, preferably blues or greens, and bright yellows or oranges were avoided.	Johnston, 1977
Lighting for the exam room had a high CRI to obtain correct skin tones and truer colors.	Boyce, 1981
Two four-lamp (2 x 4 ft.) recessed or surface mounted lights recommended for the exam room to maintain a light level of 100 foot-candles.	Malkin, 1990
Vinyl composition tile or seamless resilient flooring was used in the exam/treatment room.	All in a Dayís Work, 1999 AIA, 1987; Johnston, 1977; Malkin, 1990
The exam room door was at least 2 ft. 10 inches to accommodate wheel chairs.	Johnston, 1977

The exam room was equipped with a sink with hot and cold water, a writing shelf, a mirror, movable partitions, and a bed.	AIA, 1987; Butin, 2000; Health in Schools, 2004; Johnston, 1977
A sink large enough to prevent splashing with lever handles was installed.	Castaldi, 1994; Noskin & Peterson, 2001
Cabinetry provided storage under the sink and to one side of the sink area.	Johnston, 1977
The surface of the cabinetry provided a writing surface.	Johnston, 1977
The sink and cabinetry were located on the wall with the door or on the wall initially seen as one walked into the room.	Malkin, 1990
Sink had a single lever faucet with a paper towel and soap dispenser mounted on the wall near the sink.	Malkin, 1990
The sink cabinet was a minimum of 48 inches long, 24 inches deep, and 36 inches high, and had a finish that was not painted.	Malkin, 1990
A wall hung writing shelf was provided at the end of the sink cabinet with a rolling stool stored underneath the shelf and a trash slot cut into the face of the sink cabinet.	Malkin, 1990
Windows were not necessary in the exam room.	Johnston, 1977; Malkin, 1990
(For dermatology use) Windows, 42 inches off the floor, created privacy in the exam room, and gray, not bronze, glazing was used on the windows.	Malkin, 1990
Slatted metal window blinds or vertical blinds provided privacy without sacrificing light or view.	Malkin, 1990
Glass-block windows were recommended in exam rooms.	Fogarty, 1998
The exam room door opened away from the wall.	Malkin, 1990
A pocket door was recommended with pediatric patients.	Malkin, 1990

Doors with obscure glass were recommended in the treatment area to provide privacy	Jelliffe & Schipp, 2002
Exam rooms had acoustical treatments that provided privacy for conversations between patient and provider.	Center for Health in Schools, 2004
Pediatric exam rooms required two electrical outletsóone over the sink cabinetry and one near the exam table or bed.	Malkin, 1990
Outlets were located out of reach of small children.	Malkin, 1990
Exam table placed against the wall for pediatric patients.	Malkin, 1990
The exam table was 27 inches wide and 54 inches long with a pullout footboard.	Malkin, 1990
Patterned tile or sheet vinyl floors, use of colorful wall coverings, and artwork appropriate for children were placed in the exam room.	Malkin, 1990
Design Element: **Rest Area**	**Source:**
Curtains around the bed created a snug, secure and self-contained environment.	Chaney, 1973
Rest area for ill students had cots with vinyl-coated cubicle curtains and a dimmable light fixture for each cot.	Jelliffe & Schipp, 2002
Recliners rather than beds in the rest area recommended.	Medical Center of Georgia, 2000
Design Element: **Restroom**	**Source:**
Restroom is essential.	Hawkins & Lilley, 1998
Washable, semi-gloss paint in soft greens, blues, or pinks with darker accent colors were recommended for the lavatory area.	Davini, 1952
Ceramic mosaic tiles which were resilient and easy to clean and maintain provided a safe floor option for restrooms.	All in a Dayís Work, 1999; AIA, 1987; Malkin, 1990

The bathroom was well-lighted, ventilated and wheelchair accessible with grab bar next to toilet.	Bar & Galluzzo, 1999; McKibben & DiPaolo, 1997
A changing table, washer, dryer, and shower area with a seat were provided in the bathroom area along with equipment and a storage area for supplies for special needs students.	McKibben & DiPaolo, 1997
Design Element: **Security, Storage and Safety**	**Source:**
Medical records were kept in a separate room if records were kept on open shelves.	Johnston, 1977
Locking file cabinets for records and locking storage were provided.	AIA, 1987; Butin,2000; Center for Health in Schools, 2004 a & b; Hubler, 1996; Jelliffe & Schipp, 2002
Equipment and storage cabinets had fluorescent lights mounted in them.	
Lockable areas for staff and student personal items were provided.	Frasca-Beaulieu, 1999
A refrigerator with locking compartments was recommended to store medicine requiring refrigeration.	Jelliffe & Schipp, 2002
The disposal and removal of medical wastes, in accordance with the MOSHA law, and a separate security system were available for the clinic area.	*Floor Plan,* 2003; Health in Schools, 2004b

Safety glass, wired glass, or plastic glazing material that resisted breakage and created no cutting edges when broken were recommended for doors, sidelights, and windows glazed to within 18 inches or 46 cm of the floor.	AIA, 1987

Design Element: **Furnishings and Treatments**	**Source:**
Hooks for opening and closing doors, flush door saddles, and blade faucet controls were recommended.	Bar & Galluzzo, 1999; Rosenfield, 1972
Surface areas in a health care facility were aesthetically appealing but easily cleanable and water resistant.	Center for Health in Schools, 2004; Noskin & Peterson, 2001
Wall coverings, walls and ceilings were fluid resistant and easily cleanable in areas where contact with blood and body fluids occurred.	Noskin & Peterson, 2001
Changes in lighting, accent walls, and artwork were present.	Malkin, 1990
Healthcare facility reflected an understanding of the specific population and cultures by using cultural artwork, artifacts and furnishings, and ease of access, comfort, convenience, and efficiency were considered.	Frasca-Beaulieu, 1999
Warm colors and residential type furnishings brought an inviting, homelike, user friendly, familiar and relaxing dÈcor for the medical facility.	Frasca-Beaulieu, 1999
ìVisual noiseî or the use of too many wall decorations was avoided.	Grangaard, 1993; Rouk, 1997
Sunlight, clean, fresh air, and the colors of earth and sky were present.	Grangaard, 1993
Televisions in waiting rooms, use of abstract art, and close-up pictures of animals staring directly at the observer were avoided.	Ulrich, 1990
A variety of fabrics and finishes and using differing scale in furnishings were present.	Gappell, 1991
Furnishings with rounded corners and ergonomically designed furniture insured bodily comfort, and an environment including furniture scaled for young children enhanced their sense of independence.	Gappell, 1991

Use of real photos of children of diversity, painted ceiling tiles, vinyl wall coverings, and sophisticated colors were recommended.	Fogarty, 1998

Recommended furnishings for a school based health center were: bulletin boards, desks, tables, chairs, bookcases, display cases, cots or beds, locked storage cabinets for medications, syringes, etc., file cabinets, magazine racks, display racks for brochures, marker boards/chalkboards, children's toy chest, computer terminals and printers, telephones, photocopier, wall clocks, refrigerator, freezer, and specialized medical/dental equipment.	Center for Health in Schools (2004b)
Additional recommended equipment was: medications, oxygen tank with stand, xmas tree connector/O2 key, drinking cups, soap, arm boards, arm sling, Kleenex, bio-hazard container, gloves, syringes, bleach, heating pad, batteries, telephone, copier, computer, printer, fax, and calculator.	Medical Center of Georgia, 2000
A portable high-intensity light was provided for examinations.	Malkin, 1990
Furnishings and equipment recommended in a clinic in Maryland were: a desk, chairs, bookcase, locking file cabinet, answering machine, and supply cabinets with locks. Additional medical equipment was a wall mount blood pressure gauge or cuffs (adult/ child), wall mount otoscope-opthamaloscope, wall mount sharps container, thermometer, peak flow meter, accucheck, scoliometer, tympanogram, hemocue, refrigerator/freezer, microscope, nebulizer, eye chart & eye cover, single container for crash cart supplies, and step-on garbage cans.	Center for Health in Schools, 2004a

Environmental design of the facility fostered a sense of control, access to social support, and access to positive distractions for the patients.	Ulrich, 1990
Space and use of a music system were provided.	Malkin, 1990