Journal of Caring Sciences, 2017, 6(1), 5-17
doi:10.15171/jcs.2017.002
http:// journals.tbzmed.ac.ir/ JCS

The Impact of Comprehensive School Nursing Services on Students' Academic Performance

Deniz Kocoglu[1*], Oya Nuran Emiroglu[2]

[1]Public Health Nursing Department, Health Science Faculty, Selcuk University, Konya, Turkey
[2]Public Health Nursing Department, Nursing Faculty, Hacettepe University, Ankara, Turkey

ARTICLE INFO

Article Type:
Original Article

Article History:
Received: 11 Jan. 2017
Accepted: 12 Feb. 2017
ePublished: 1 Mar. 2017

Keywords:
School nursing
Nursing service
Academic
Student

ABSTRACT

Introduction: School nursing services should be evaluated through health and academic outcomes of students; however, it is observed that the number of studies in this field is limited. The aim of this study is to evaluate the impact of comprehensive school nursing services provided to 4th grade primary school students on academic performance of students.

Methods: The quasi-experimental study was conducted with 31 students attending a randomly selected school in economic disadvantaged area in Turky. Correlation analysis, repeated measures analyses of variance, multiple regression analysis were used to analyze the data with SPSS software.

Results: At the end of school nursing practices, an increase was occurred in students' academic achievement grades whereas a decrease was occurred in absenteeism and academic procrastination behaviors. Whilst it was determined that nursing interventions including treatment/ procedure and surveillance was associated to the decrease of absenteeism, it also was discovered that the change in the health status of the student after nursing interventions was related to the increase of the academic achievement grade and the decrease of the academic procrastination behavior score.

Conclusion: In this study, the conclusion that comprehensive school nursing services contributed positively to the academic performance of students has been reached. In addition, it can be suggested that effective school nursing services should include services such as acute-chronic disease treatment, first aid, health screening, health improvement-protection, health education, guidance and counseling and case management.

Please cite this paper as: Kocoglu D, Emiroglu ON. The impact of comprehensive school nursing services on students' academic performance. J Caring Sci 2017; 6 (1): 5-17. doi:10.15171/jcs.2017.002.

Introduction

Today, the relationship between health and academic achievement has been shown. For the reason, it can be said that the interest in the evaluation of the impact of school health clinics on academic performance has increased.[1,2] Comprehensive school health services, which comprises such components as health services, health education, healthy environment, physical activity programs, counseling, psychology, social services, nutrition services, improving employee well-being, family-society involvement approaches, are said to contribute to the academic performance of students in various ways.[1-4]

Previous studies found that the health services provided at school can alleviate the problem of absenteeism, late-coming, and undisciplined student behavior, and increase graduation rate and Grade Point Average (GPA).[2,5,6] Topics such as the evaluation of school health services and the contribution of nurses to the effectiveness of such services remain to be explored in the literature.[7-9]

It is suggested that the school nurses who take part in every level of school health services can play an important role in the assessment and management of health risks of students and in having students adopt healthy life behaviors, and that many nursing practices

***Corresponding Author:** Deniz Kocoglu, (PhD), email: deniizkocoglu@gmail.com.

have a positive impact on attendance rates and overall education.[10-14]

Previous studies in the field show that in schools where nurses are employed, absenteeism associated with medical reasons are lower, and graduation rates, in-class participation, grades, and the rate of participation in social activities are higher. Leaving school early due to injury or sickness becomes a less common phenomenon when students are able to see a nurse at school.[12,15-17]

Maughan[12] emphasizes that there are findings contained in the literature in relation to a low rate of leaving school due to medical reasons and absenteeism because of illnesses and high rate of students graduation at schools, where school nurses work. However, in the same evaluation, it is stated that these findings do not commonly demonstrate the direct impact of school nurses on academic achievement due to methodological reasons and that there is a need for studies to be performed in this field. It is necessary that the effectiveness of nursing practices be evaluated in relation to student academic performance in order for school nurses to become more visible.

In addition, this evaluation is crucial for bringing school nurse job descriptions in Turkey in line with the modern roles and functions of nursing, opening positions for nurses at schools, and for creating the necessary infrastructure in education. For these reasons, this study was therefore conducted with the aim of evaluating the impact of comprehensive school nursing services, which comprises such activities as health education, counseling, case managements, follow-ups, and treatments/ procedures concerning environmental, psychosocial, physiological, and health-related behaviors of students as well as the relations between family-school and society, on the academic performance of students.

Materials and methods

The study was one group quasi- experimental study which interventions and assessments were repeated in time intervals. Data of this study was extracted from a thesis entitled, "the impact of comprehensive school health nursing services on students' academic performance". The data was gathered over 8 months. The selection of school was made by random among disadvantaged schools. The school where the study has been conducted is located in a region, which is low in socio-demographic terms, is a slum settlement and has a high rate of child labor.

There wasn't school nurse or a health unit at the school where the study was conducted. In order to determine the study group, the size of the sample was calculated using the G*Power program. With the help of this program, the average change in academic achievement grades at schools where comprehensive school health services have commenced being provided,[5] has been anticipated and an estimate sample size has been determined as 29 persons (β=0.80, α=0.05). In this school, there were three classes in the fourth grade.

After the work program, the research process, and planned interventions were explained to teachers, the class of the teacher who accepted to participate in this study was included in the study and the 31 students in this class constituted the study group of this study. The reason for the study being conducted with primary school fourth grade students was the students having adequate experience with school life and the learning process; thus, it was possible to assess the impact of school nursing services on academic performance better. As health services provided to students in Turkey was not organized on a school basis, a health unit and school nursing implementation system was set up by the researchers.

The ethical permission for this research was received from the clinical research ethics committee (December, 9, 2009; No: 263). The students and school environment were evaluated with the "School Health Assessment Form". The school health assessment form consists of three sections oriented at assessing "school/classroom environment", "student health condition" and "student academic performance". In the implementation of the

nursing process, the "OMAHA System" and forms related to this system[18-23] were utilized.

Assessment of the school – classroom and environment: In this section, there are questions including information about geographical characteristics of the school, environmental risk factors, physical characteristics of the school playground – the interior of the school and classroom, canteen and workers at the canteen.

Assessment of the student health condition: In the section on student health of the school health assessment form, there are domains that assess the socio-demographic characteristics of the student, definitive information about families, medical history, family history concerning chronic illnesses, immunization status, examinations concerning health, vital findings, physical examination results and healthy lifestyle behavior. In this section of the form there is the Pediatric Quality Of Life Inventory (Pedsql 4.0) On Turkish Children for the purpose of having students self-evaluate their health condition and the Child Health Questionnaire Parent Form (CHQ-PF)" for the purpose of having families evaluate the students.

The Pediatric Quality of Life Inventory 4.0, was developed by Varni et al.,[18] for the purpose of assessing quality of life in healthy school children aged between 8–12 years and its Turkish reliability and validity was performed by Sönmez & Başbakkal.[19] In this five point likert type inventory consisting of a total of 23 items covering Physical functioning (8 Items), emotional functioning (5 Items), social functioning (5 Items) and school functioning (5 Items), it is possible to score "0" at the lowest and "2300" at the highest and thus a high level score indicates that life quality concerning health is better. The Child Health Questionnaire (CHQ) was developed to assess the general health condition of children between the ages of 5-18 and the questionnaire has two separate forms, which are the parent form and the youth form. The family form used in this study (CHQ PF- 50), consists of 50 items. The scale has 15 separate subscales consisting of global health, physical functioning, role/social limitations –due to emotional and behavioral difficulties, bodily discomfort, behavior, global behavior, mental health, self-esteem, general health perceptions, change in health, and emotional impact on parent-time impact on parent, family activities, and family cohesion. Every subscale has a value between 0-100 and the high score indicates good functioning. It isn't possible to obtain a full score from the scale; however, physical and psychophysical summary scores are calculated. The Turkish reliability and validity works of the scale were performed by Özdogan et al.[20]

Assessment of Academic Performance: In the section oriented at the assessment of academic performance, there is a part in which the achievement grades related to lessons and the status of absenteeism is recorded and also there is an "Academic Procrastination Behavior Scale". The Academic Procrastination Behavior Scale is a form developed by Çakıcı[21] consisting of 19 expressions, covering the duties students are responsible for fulfilling in their educational lives (such as studying, preparing for exams, preparing projects) of which 12 are negative and 7 are positive. The expressions in this scale are rated according to the five point likert scale as "it does not reflect me at all", "it reflects me very little", "it reflects me to some extent", "it largely reflects me", and "it completely reflects me". A minimum score of 19 and a maximum of 95 can be obtained from this scale, which is a reliable and valid instrument in designating the academic procrastination behavior of students and the high score obtained indicates that the students have academic procrastination behavior.

The Omaha System is a classification system developed by the Visiting Nurse Association (VNA), which includes the basic nursing process elements such as nursing diagnoses, nursing interventions and assessment stages.

The Omaha System consists of three complementary sections, which are the Problem Classification Scheme (PCS), Intervention Scheme (IS), and the Problem Rating Scale for Outcomes (PRS). The Omaha

PCS includes four domains determining nursing diagnosis, 42 problems and 312 symptom-findings. The domains are grouped in the scope of the (1) environmental, (2) psychosocial, (3) physiological, and (4) health related behavior domain and each problem can be evaluated as improving health, potential risk, and actual (symptom-finding).[22]

The Omaha IS groups the implemented nursing interventions. It provides the opportunity for grouping nursing activities such as (1) health education, guidance and counseling, (2) Treatment and procedure, (3) Case management, and (4) Surveillance. The Omaha Problem Rating Scale for Outcomes is a likert type scale, which explains the development related to the identified problem.

According to each diagnosis, knowledge-behavior, and status criteria, there is a rating between 1 and 5. The knowledge criteria, is a domain which evaluates the ability of the individual to remember and construe knowledge and is evaluated as "No knowledge (1), Low level (2), basic level (3), Sufficient level, and (4) High level (5)". The behavior criteria is the domain that evaluates whether or not the individual performs the expected behavior oriented at the observed response or target and can be rated as Not relevant (1), rarely relevant (2), Neutral (3), Generally relevant(4), and Always relevant (5).

The status criteria evaluates the existence of present objective and subjective symptoms and findings and status is rated as very severe (1), Severe (2), Medium level (3), Very low level (4), and None (5).[22] The Turkish reliability and validity works of the Omaha System were performed by Erdoğan & Esin. [23]

During the implementation stage of the research, a health unit was opened at the school, where nursing services were delivered. In addition, home visits to families were scheduled in case of need. In this research, nursing interventions were implemented in the following order:

1. Data that were collected through data collection forms, observation, personal applications, acute occurrences, and notification by parents or teachers were evaluated, and nursing diagnoses were made according to PCS, using symptoms/findings associated with a particular health problem. The research also included diagnoses that did not include symptoms-findings for health improvement.
2. These diagnoses were evaluated according to PES, and the knowledge, behavior, and status of students were assessed. The diagnoses were then put in the order of priority.
3. Appropriate goals were specified using the Omaha System goals. In the research, the goals specified for the nursing care period generally required interventions at the level of students, families and society.
4. Nursing interventions were implemented in order to attain the specified goals. IS includes the categories of surveillance, teaching/ guidance/ counseling, treatment/ procedure and case management.

Surveillance intervention scheme involves monitoring symptoms and findings related to health problems, monitoring the healing process, identifying whether the health problem recurs, monitoring the implementation of treatment plan, following-up for any possible side effects or complications associated with treatment plan, monitoring whether students adopt the advised health behaviors, and repeating the necessary screening process periodically for students who have a family history for certain illnesses. Teaching, guidance, and counseling interventions concern managing health problems, health responsibility, life skills, healthy lifestyle behaviors, appropriate leisure activities, using correct resources, and developmental period needs.

Case management intervention scheme is used for diagnoses that extend beyond the role, responsibility of a nurse and the capacity of workplace facilities, and that require other professionals' involvement. Case management interventions implemented in this study involves social aid organizations and local administrations in the environmental domain; guidance service, social service specialists, and psychologists in the psychosocial domain;

health institutions and health professionals in the physiological domain; and all the above-mentioned institutions and professionals in the domain of health behaviors. The treatment/procedure scheme involves interventions concerning acute or chronic diseases, accidents, injuries, and contagious diseases.

5. The status of students with regard to diagnosis was re-evaluated on the basis of PES, and some nursing interventions were repeated.

6. The status of students with regard to diagnosis was evaluated according to PES for the third time.

New care plans were prepared for diagnoses that did not attain the desired goals after repeated interventions and for newly identified or acute conditions.

In this study the change occurring in the student's health status as a result of nursing services was evaluated by the nurse, student, and the family. The nurse evaluated the change in student's health with the Omaha Problem Rating Scale for Outcomes score used uniquely for nursing diagnoses; the student evaluated the same with the Pediatric Quality of Life Inventory, and the family performed the evaluation with the Child Health Questionnaire Parent Form and these scores were accepted as independent variables. These evaluations were repeated three times in the beginning (first week of school-September), middle (four months later- January) and the end of the study (June). Academic performance was evaluated with the absenteeism status, academic procrastination status, and academic achievement grade and these variables were accepted as the dependent variables of the study. Academic procrastination status was evaluated three times as the first week of school, four months later and the end of the study, whereas academic achievement grade was evaluated twice as the end of the first semester and the second semester, and the absenteeism was assessment twice as the end of previous academic year and this academic year. Correlation analysis, repeated measures analyses of variance, paired t-test were used in data analysis. The health determinants of academic procrastination behavior score and academic achievement score were evaluated with multiple regression analysis.

Results

The average age of students in the study is 9.4 (0.7) and 54.8% of them were male. There were no students with disabilities in the study group that may significantly hinder the learning process.

During the study 426 nursing diagnoses/ problems were identified. The distribution of student problems among four domains was as follows: 33.9% health behaviors, 32.8% physiological, 25.6% psychosocial, and 7.7% environmental. 986 nursing interventions were applied to nursing diagnoses. According to the Omaha Nursing Intervention Scheme, it was observed that the most frequently implemented intervention was surveillance at a rate of 41.9% and health education/guidance /counseling has been used at a rate of 40.1%, treatments and procedures at a rate of 9.7%, and case management at a rate of 8.3 %.

According to the repeated measures analyses of variance , it was observed that the nursing interventions performed in the environmental, psychosocial, physiological, and health behaviors domain and all diagnoses in total created a statistically significant change over the students' knowledge, behavior and status score and that according to student evaluation, a significant increase happened in students' quality of life and that according to the family evaluation, students' physical and psychosocial health scores increased significantly during the study ($P<0.05$).

According to the Bonferroni correction test, it was determined that within these evaluations the score average had the lowest value in the pretest but the score average had the highest value in the posttest. In the academic performance evaluation it was determined that students' average number of absenteeism 5.9 (2.9) was lower than that of the students in the previous year 8.4 (7.6) and that

second term average grade was higher than that of the first term in academic year which conducted this study. The academic procrastination scale had the highest value in the pretest and had the lowest value in the posttest and it was observed that these evaluations were statistically significant (P<0.05) (Table 1). In the study a relation wasn't found according to the correlation analysis between the number of absenteeism and the nursing intervention number implemented in education/ guidance/ counseling and case management scheme (P>0.05).

A weak relation was determined between the number of students' absenteeism and total number of nursing interventions (r=-0.407) and number of surveillance (r=-0.378) interventions but a medium level of relation was determined with number of treatments and procedures (r=-0.526) interventions (P<0.05). The increase in the number of nursing interventions within these domains decreased the students' absenteeism status (Table 2).

Table 1. Change in students' health status and academic performance

Variable	First evulation Mean(SD)	Second evulation Mean(SD)	Final evulation Mean(SD)	Test value€	P-value¥
I-Health status					
School nursing evulation (According to the omaha problem rating scale for outcomes)					
Environmental Domain					
Knowledge	2.5 (0.8)	4.1(0.6)	4.7(0.5)	78.830	<0.0001
Behavior	2.2(0.6)	2.9(0.8)	3.6(1.0)	21.880	<0.0001
Status	2.1(0,5)	2.8(0.8)	3.4(1.1)	20.186	<0.0001
Psychosocial Domain					
Knowledge	2.3(0.5)	3.9(0.5)	4.7(0.3)	262.33	<0.0001
Behavior	2.1(0.4)	3.3(0.5)	4.2(0.5)	1.452	<0.0001
Status	2.2(0.6)	3.2(0.5)	4.1(0.5)	1.106	<0.0001
Physiological domain					<0.0001
Knowledge	2.3(0.4)	4.0(0.4	4.8(0.2	498.587	<0.0001
Behavior	1.8(0.4)	3.3(0.4	4.2(0.3)	502.21	<0.0001
Status	1.7(0.3)	3.0(0.4	4.2(0.5)	394.64	<0.0001
Health related behavior Domain					
Knowledge	2.2(0.3)	3.8(0.3)	4.7(0.2)	726.28	<0.0001
Behavior	2.0(0.3)	3.2(0.4)	4.0(0.3)	347.23	<0.0001
Status	2.0(0.5)	3.2(0.4)	3.9(0.2)	205.14	<0.0001
Total					<0.0001
Knowledge	2.3(0.3)	3.9(0.3)	4.7(0.2)	903.21	<0.0001
Behavior	2.0(0.2)	3.2(0.1)	4.0(0.4)	344.0	<0.0001
Status	2.0(0.3)	3.1(0.4)	3.9(0.4)	431.51	<0.0001
Student evaluation *(*According to the pediatric quality of life inventory*)*					
Pediatric quality of life Inventory score	1695.9(401.6)	1918.5(313.4)	1992.7(266.3)	15.920	0.001
Parent evaluation (According to the child health questionnaire)					
Physical health	69.47(11.5)	78.20(11.0)	84.6(8.8)	1.05	<0.0001
Psychophysical health	73.93(12.1)	80.77(10.4)	83.6(9.2)	37.80	<0.0001
II- Academic performance					
Absenteeism	8.4(7.6)	-	5.9 (2.9)	-2.146	0.040
Academic grades	-	74.1(10.6)	77.1(9.2)	-5.257	<0.0001
Academic procrastination behavior	55.4(16.5)	46.8(12.0)	42.0 (10.7)	38.63	<0.0001

€ Repeated measures analyses of variance, ¥ significant value

Table 2. The relation between the number of nursing interventions and the students' absenteeism status

Variable	Absenteeism	
	r	P
Intervention Scheme		
Health education/guidance /counseling	-0.230	0.213
Case management	-0.089	0.636
Treatments / procedures	-0.526	0.002*
Surveillance	-0.378	0.036*
Total nursing interventions	-0.407	0.023*

*Statistically significant

It was ascertained behavior score in psychosocial domain, knowledge score in physiological domain, knowledge, behavior and status score in health behavior domain and total score in all domains showed a positive correlation with the students' academic grade average of the second term and that the increase in the score levels stated was associated with the increase in the academic achievement grade (P<0.05). It is designated that behavior and status score in psychosocial and health behaviors domain and knowledge, behavior, and status score obtained for all diagnoses showed a negative correlation with the students' academic procrastination behavior and that the increase in the score levels stated was associated with the decrease in the academic procrastination behavior score (P<0.05) (Table 3).

Table 3. The relation between the school health nursing services and the students' academic achievement score, academic procrastination behavior score (according to the Omaha problem rating scale for outcomes and the final evaluations)

Omaha Problem Rating Scale	Academic grade average	Academic procrastination behavior
	r	r
Environmental domain		
Knowledge	0.235	-0.218
Behavior	0.336	-0.306
Status	0.295	-0.320
Psychosocial domain		
Knowledge	0.224	-0.231
Behavior	0.380*	-0.366*
Status	0.309	-0.370*
Physiological domain		
Knowledge	0.364*	-0.149
Behavior	0.186	-0.266
Status	0.165	-0.319
Health related behavior Domain		
Knowledge	0.542*	-0.302
Behavior	0.558*	-0.648*
Status	0.409*	-0.643*
Total score		
Knowledge	0.508*	-0.362*
Behavior	0.492*	-0.509*
Status	0.407*	-0.540*

*Statistically significant, P<0.05

It was observed that multiple regression model that was composed of the final rating score of the Omaha Problem Rating Scale for Outcomes, the Pediatric Quality of Life Inventory, and the Child Health Scale (Parent form) was significant both for

students' academic grade average (F=9.798, P=0.000) and for students' academic procrastination behavior score (F=13.909, P=0.000). It was determined that the Omaha Problem Rating Scale for Outcomes and quality of life scores were determinant over the change academic grade score among students at the rate of 52.1 % and an increase in these scores had a positive impact on academic grade score. Moreover it was determined that Omaha Problem Rating Scale for Outcomes score and the quality of life and child health scale score were determinant over the change academic procrastination behavior score among students at the rate of 60.7% and that according to the Omaha Problem Rating Scale for Outcomes, the students' scores of health state improvement and the increase in quality of life reduces academic procrastination behavior and that the increase in child health scale score had a reverse impact although it provides less contribution to the model (β=0.342) (Table 4).

Table 4. The relation of students' academic grade average and academic procrastination behaviors with the health status (according to the final evaluations)

Determinant	Academic grade average			Academic procrastination behavior		
	Beta	t	P	Beta	t	P
Omaha problem rating scale[€]	0.29	2.15	0.04	-0.45	-3.67	0.001
The pediatric quality of life inventory	0.65	4.24	0.00	-0.64	-4.64	0.000
The child health scale (Parent form)[¥]	-0.11	-0.73	0.46	0.34	2.48	0.019
	R^2=0.52	F=9.79	P=0.00	R^2=0.60	F=13.90	P=0.00

[€]As there is a high correlation between total knowledge, behavior score averages and the status score averages obtained according to the OMAHA Problem Rating Scale for Outcomes, a status score model is included. [¥]As there is a correlation between physiological and psychological summary average scores of general health scale evaluated by parents, a physiological summary score model is included.

Discussion

In this research, a total of 926 nursing interventions in the categories of surveillance, teaching/guiding/counseling, case management, and treatment/procedure were implemented for 426 nursing diagnoses. After these interventions, it was found that the knowledge, behavior and status of students concerning nursing diagnosis improved, and the quality of life of students increased. Families also stated that they had observed a drastic change in the health status of students. Studies show that especially the services provided by school nurses through case management interventions increase Students' quality of life and success in coping with illnesses, and decrease the number of health-related complaints.[17,24] On the other hand it was emphasized that School-based health centers can be reduce health inequity among students.[25]

Regarding academic performance, it was seen that absenteeism decreased substantially compared to the previous year, procrastination became less of a problem, and grades improved. It is thought that the following nursing interventions applied in this study might have helped prevent student absenteeism associated with health problems:

-Working full-time at school.
-Taking preventive measures for contagious diseases, accidents, and injuries.
-Monitoring the implementation of these measures.
-Examining students in case of an acute disease and taking the necessary action
-Examining students at school in case of an accident or injury, and implementing firstaid procedures.
-Preparing facilities so that treatment can be continued at school in case of an illness.
-Planning for doctor appointments outside school hours on behalf of students.

The result of the correlation analysis between the number of nursing interventions and absenteeism also supports this interpretation. According to the correlation analysis, there is a negative correlation between the number of

treatment/procedure and surveillance interventions and absenteeism. Constante[10] suggests that nursing interventions positively influence attendance. Many studies and literature reviews show that absenteeism rates decrease once students start seeing the nurse at school. It is suggested that this negative correlation is stronger in schools where nurse-student rate is lower, and the school nurse works full-time, and that nursing interventions aimed at students with high absenteeism help reduce absenteeism rates.[12,15,16,26,27]

Both the present study and the literature on the subject show that the presence of school nurses prevents absenteeism associated with medical reasons, and that these preventive mechanisms are much more effective when school nurses work full-time.

A statistically significant difference was observed between the GPAs of students in the first and second semesters ($P<0.05$).

It was found that according to Omaha PRS, a scale that evaluates the nursing process, there is a statistically significant relationship between academic success and psychosocial behavior scores, physiological knowledge scores, and health-behavioral knowledge, behavior and status scores. It was seen that a rise in these scores also increased final grades. Increase in psychosocial behavior scores due to nursing interventions, elimination of the problems in this domain, and the implementation of nursing interventions at the level of students, families and society might have had a positive influence on students' academic success. Puskar & Bernardo[28] suggest that it is very difficult for students to actualize their academic potentials when their mental health problems go unnoticed, and that mental health is the key intervention to increase academic success.

The authors also emphasize the importance of implementing the nursing interventions in this domain with a particular focus on individual, system and society. Both the findings of this study and the literature on the subject show that doing mental health screening on a regular basis is as important as physical screenings. This study finds physiological knowledge score to be another factor affecting academic success. In this study, the knowledge presented to students was more about bringing an illness under control and taking measures in order to prevent the illness from recurring. One study shows that nursing interventions implemented on students with chronic illnesses increase the knowledge and skills of students in coping with their illnesses and help boost students' academic success.[17]

The positive influence of health-behavioral knowledge and behavior scores on academic success is supported by many studies in the literature. Previous studies in the literature show that making exercise a habit, regulation nutrition, and having high-quality sleep positively influence students' grades.[29-32] Another finding of previous studies is that the increase in knowledge, behavior, and status scores in all diagnoses in the Omaha system boosts academic success. In light of this finding, it could be said that school nurses play an important role in students' school performance by improving their health behaviors, managing present health problems, reducing absenteeism, and evaluating students at school and home to assess and monitor risks concerning their development, health, and learning.

The last variable used in the analysis of academic performance was procrastination behavior scale. In this research, it was found that procrastination habits were at a moderate level among students, and that the procrastination scores went down over the course of the research ($P<0.05$). At the end of the research, it was seen that the behavior and status scores in psychosocial and health-behavioral domains and the total knowledge, behavior, and status scores lowered procrastination behavior scores. In the psychosocial domain, practices applied in this study such as:

-Resolving mental health problems,
-Providing students with skills to cope with stress,
-Arranging appropriate leisure time activities,
-Considering problems associated with T.V. and computer use,
-Directing students to sports/ artistic activities and practicing interventions to make students adopt positive health behaviors might have influenced the academic behaviors of students positively.

Previous studies also suggest that positive changes in students' health behaviors have a positive impact on their academic and general behaviors. Kleinman et al.'s study,[31] in which they observed an improvement in absenteeism and behavioral problems, an increase in success at Mathematics, is another support on this point.

In this research, it was seen that Omaha PRS, which shows the health status of students when the nursing process is over, and pediatric quality of life inventory score had a decisive effect on GPAs, while Omaha PRS, pediatric quality of life score, and child health scale had a decisive effect on students' procrastination scores ($P<0.05$).

Among the students whose grades changed over the course of the research, 52% were influenced by health-related changes. Increase in Omaha PRS and quality of life scores were two important factors increasing students' GPA. Among the students whose procrastination scores changed over the course of the project, 60% were influenced by health-related changes.

An increase in Omaha PRS and quality of life scores brought about a fall in procrastination scores, while an increase in child health scale scores brought about an increase in procrastination scores. This evaluation shows that nursing interventions that improve students' quality of life have an important influence on academic performance. Other studies also present findings that suggest school health nursing interventions increase students' quality of life and academic success.[17,24] In this study, it was found that the child health scale that included an evaluation of family and the health status scores that are calculated on the basis of nurse and student evaluations affect students' procrastination scores in opposite ways. This might be because the families in the study group might not have been able to accurately assess the changes in the academic performance of students due to the limited time they could spend together and thus the low level of exchange among family members. Another reason might be that families regarded the developmental behavior characteristics of students as a problem, and that families living in socioeconomically disadvantaged neighborhoods had very high academic success expectations.

When all the findings obtained from the study are evaluated altogether, the most important element having an impact on the student's health and academic status may be associated with the accessibility of a school nurse for students at school at any time and the availability of permanent service rendered by the nurse. Also in the literature it can be observed that school-based health services and school nursing services are service rendering types that provide positive contribution to students' health and academic results.[4,6,10,11,17, 26,27,33-35]

Conclusion

As the school nurse may be able to impermanent several practices that have an impact on academic performance simultaneously, it may be considered that the nurse's effect on academic performance is versatile and continuous. In the study it can be observed that in order to ensure the expected improvement in students' health and academic results, a full-time school nurse with a postgraduate diploma /certificate should be employed in the school environment and that for rendering a comprehensive health service the school nurse should play different roles in respect

of care, health screening, advocacy, case management, contact with the society, home visits, counseling and there should be regulations to support the nurse in this direction. It may be said that in order to increase the student's academic performance the school nurse should perform the nursing interventions concerning physical, psychosocial, health behaviors, and the environmental domain and that the most important objectives of nursing interventions should be focused on improving student's quality of life, making them acquire life skills, and developing their positive health behaviors.

Acknowledgments

Researchers are very grateful to all of students and their parents who accepted to participate in this study.

Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

References

1. Resnicow K, Allensworth D. Conducting a comprehensive school health program. J Sch Health 1996; 66 (2): 59-63. doi:10.1111/j.1746-1561. 1996. tb07 910. x.
2. Murray NG, Low BJ, Hollis C, Cross AW, Davis SM. Coordinated school health programs and academic achievement: A systematic review of the literature. J Sch Health 2007; 77 (9): 589-600. doi: 10.1111/j.1746-1561. 2007. 00238.x
3. Rosas S, Case J, Tholstrup L. A retrospective examination of the relationship between implementation quality of the coordinated school health program model and school level academic indicators over time. J Sch Health 2009; 79 (3): 108-15. doi: 10.1111/j.1746-1561.2008.00394.x
4. Aldinger C, Zhang XW, Liu LQ, Pan XD, Yu SH, Jones J, Kass J. Changes in attitudes, knowledge and behavior associated with implementing a comprehensive school health program in a province of China. Health Educ Res 2008; 23 (6): 1049-67. doi: 10.1093/ her/cyn022
5. Van– Cura M. The relationship between school based health centers, rates of early dismissal from school, and loss of seat time. J Sch Health 2010; 80 (8): 371-77. doi: 10.1111/j.1746-1561. 2010. 00516.x.
6. Geierstanger SP, Amaral G, Mansour M, Walters SR. School based health centers and academic performance: research, challenges, and recommendations. J Sch Health 2004; 74 (9): 347-52. doi:10.11 11/j.1746-1561.2004.tb06627
7. Gordon SC, Barry CD. Development of a school nursing research agenda in Florida: A Delphi study. J Sch Nurs 2006; 22 (2): 114-9.
8. Hootman J. The importance of research to school nurses and school nursing practice, J Sch Nurs 2002; 18(1): 18-24. doi: 10.1177/10598405020180010501
9. Edwards LH. Research priorities in school nursing: a delphi process. J Sch Nurs 2002; 18 (3): 157-62. doi: 10.1177/ 10598405020180030601
10. Costante CC. School health nursing services role in education: The no child left behind act of 2001. J Sch Nurs 2006; 22 (3): 142-47. doi: 10.1177/ 1059 84 05060220030401
11. Grant A. The nurse in the school health service. J Sch Health 2001; 71(8): 388-9. doi: 10.1111/j.1746-1561.1937.tb 0 1692.x
12. Maughan E. The impact of school nursing on school performance: A research synthesis. J Sch Nurs 2003; 19 (3): 163-71. doi: 10.1177/1059840503 0190030701

13. Wainwright P, Thomas J, Jones M. Health promotion and the role of the school nurse: a systematic review. J Adv Nurs 2000; 32(5): 1083-91 doi: 10.1046/j.1365-2648.2000.01579.x
14. Weismuller PC1, Grasska MA, Alexander M, White CG, Kramer P. Elementary school nurse interventions: Attendance and health outcomes. J Sch Nurs 2007; 23(2):111-18. doi:10.1622 /1059 -8405(2007)023 [0111: ESNI AA] 2.0.CO;2
15. Wyman LL. Comparing the number of ill or injured students who are released early from school by school nursing and nonnursing personnel. J Sch Nurs 2005; 21 (6): 350-55. doi: 10.1177/105984 0505021 0060901
16. Allen G. The impact of elementary school nurses on student attendance. J Sch Nurs 2003; 19 (4): 225-31. doi: 10. 1177/ 10598405030190040801
17. Engelke MK, Guttu M, Warren MB, Swanson M. School nurse case management for children with chronic illness: Health, academic, and quality of life outcomes. J Sch Nurs 2008; 24 (4): 205-14. doi: 10.1177/1059840508319 92 9
18. Varni JW, Seid M, Kurtin PS. PedsQL 4.0 reliability and validity of the pediatric quality of life inventory version 4.0 generic core scale in healthy and patient populations. Medical Care 2001; 39 (8): 800-12.
19. Sönmez S, Başbakkal Z. A validation and reliability study for thepediatrıc quality of life inventory (Pedsql 4.0) on Turkish children. Turkiye Klinikleri Journal of Pediatrics, 2007; 16 (4): 229-37.
20. Ozdogan H, Ruperto N, Kasapçopur O, Bakkaloğlu A, Arisoy N, Ozen S, et al. The Turkish version of the childhood health assessment questionnaire (CHAQ) and the child health questionnaire (CHQ). Clin Exp Rheumatol 2001; 19 (4. supll 23): 158-62.
21. Çakıcı CD. An examination of the general procrastination behavior and academic procrastination behavior in high-school and university students. [Master thesis]. Ankara: Institute of Education Sciences Ankara University; 2003.
22. Martin KS. The omaha system: a key to practice, documentation, and information management.2nd ed. United States: Elsevier Saunders; 2005.
23. Erdogan S, Esin NM. The Turkish version of the Omaha System: Its use in practice-based family nursing education. Nurse Educ Today 2006; 26 (5): 396-402. doi:10.1016/j.nedt. 2005. 11.009
24. Bonaiuto MM. School nurse case management: Achieving health and educational outcomes. J Sch Nurs 2007; 23 (4): 202-09. doi: 10.1177/105984 050 70230040401
25. Knopf JA, Finnie RK, Peng Y, Hahn RA, Truman BI, Vernon-Smiley M, et al. School-based health centers to advance health equity: a Community Guide systematic review. American Journal of Preventive Medicine2016; 51(1): 114-26. doi: 10.1016/j.amepre.2016.01.009
26. Pennington N, Delaney E. The number of students sent home by school nurses compared to unlicensed personnel. J Sch Nurs 2008; 24 (5): 290-97. doi: 10.1177/1059840508322382
27. Telljohann SK, Price JH, Dake JA, Durgin J. Access to school health services: differences between full-time and part-time school nurses. J Sch Nurs 2004; 20 (3): 176-81. doi: 10.1177/10 598405040200030801
28. Puskar KR, Bernardo LM. Mental health and academic achievement: Role of school nurses. J Spec Pediatr Nurs 2007; 12(4): 215-23. doi: 10.1111/j.1744-6155. 2007. 00117.x
29. Mindell JA, Owens JA. Sleep problems in pediatric practice: Clinical issues for the pediatric nurse practitioner. J

Pediatr Health Care 2003; 17(6): 324-31. doi:10.1016/j.pedhc.2003.09.003

30. Chomitz VR, Slining MM, McGowan RJ, Mitchell SE, Dawson GF, Hacker KA. Is there a relationship between physical fitness and academic achievement? Positive results from public school children in the northeastern United States. J Sch Health 2009; 79 (1): 30-7. doi:10.1111 /j.17 46-1561.2008. 003 71. x
31. Kleinman RE, Hall S, Green H, Korzec-ramirez D, Patton K, Pagona ME, et al. Diet, breakfast, and academic performance in children. Ann Nutr Metab 2002; 46 (Suppl 1): 24-30.
32. Kristjánsson ÁL, Sigfúsdóttir ID, Allegrante JP, Helgason ÁR. Adolescent health behavior, contentment in school, and academic achievement. Am J Health Behav 2009; 33 (1): 69-79. doi:10.5993/AJHB.33.1.7
33. Brindis CD, Klein J, Schlitt J, Santelli J, Juszczak L, Nystrom RJ. School-based health centers: Accessibility and accountability. J Adolesc Health 2003; 32 (6): 98-107. doi: 10.1016/S1054-139X (03) 00069-7
34. Soleimanpour S, Geierstanger SP, Kaller S, McCarter V, Brindis CD. The role of school health centers in health care access and client outcomes. Am J Public Health 2010; 100(9): 1597-603. doi: 10.2105/AJPH.2009.186833.
35. ckovics JR, Carroll-Scott A, Peters SMM, Schwartz K, Gilstad-Hayden C, McCaslin. Health and academic achievement: cumulative effects of health assets on standardized test scores among urban youth in the United States**.** J Sch Health 2013; 84 (1): 40-8. doi: 10.1111/josh.12117