

Prevalence of Chronic Diseases Among Elementary School Students in Şanlıurfa, Turkey

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ABSTRACT

Introduction: Chronic diseases, one of the main reasons for morbidity and mortality in all ages, are becoming a significant health problem all over the world in recent times. The population of children with chronic diseases is increasing day by day. While chronic illnesses make life difficult for school-age children, they have a detrimental impact on academic progress. Therefore, studies on this topic are required to improve their quality of life and reduce chronic disease morbidity and mortality rates. This study determines the prevalence of chronic diseases and children's health conditions in elementary school students aged 5 to 12 years.

Methods: This research was designed as a descriptive and cross-sectional study. Between September 2018 and June 2019, 158,445 students in 45 elementary schools in central Şanlıurfa was screened for chronic diseases. The sample was composed of 125 students diagnosed with chronic disease by a doctor.

Results: The prevalence of chronic diseases was determined as 78.89 for every 100,000 students [95% confidence interval (CI), 66.1-94.0]. Asthma (29.6%), epilepsy (14.4%), and hypertension (10.4%) were found as the three most prevalent diseases, and for every 100,000 students, their prevalence was determined as 23.35 (95% CI: 17.0-32.2), 11.36 (95% CI: 7.0-18.3), and 8.2 (95% CI: 5.0-14.0), respectively.

Conclusion: To the best of our knowledge, this is the first study examining the prevalence of chronic diseases and health conditions in the elementary school population. According to the results, the prevalence of chronic diseases was found to be very high among elementary school students and students' health was not at the desired and expected level. Taking into account the results of this study, the employment of school nurses seems a necessity, especially in order to increase students' life quality and school success.

Keywords: Chronic diseases, prevalence, elementary school students, school, public health

Introduction

Today, chronic diseases are a significant health problem across the world, and the pediatric population with chronic diseases is increasing day by day (1-3). Between 10% and 15% of children under the age of 18 have a chronic condition globally. However, this ratio increases over time such that an increase occurred significantly over the past two decades (2,4-6). Similarly, among approximately 25 million children in Turkey, a significant portion of children suffer from chronic diseases (3).

Chronic diseases negatively influence children's health and their school and social life. The school life of children diagnosed with a chronic illness can be interrupted due to frequent hospitalizations, check-ups, treatment, and side effects of medications, resulting in problems in children's adaptation to school (1,5,7-10). Children who cannot attend school due to a chronic condition may lag their peers in the classroom and their academic achievement may decrease as their learning process is hindered.

According to The International Council of Nurses, supporting individuals with chronic diseases to better manage their health problems takes part in the roles of nurses for the control of chronic diseases. In this outlook, public health nurses providing professional health assistance can have responsibilities for children with chronic diseases. Considering that children spend 40% of their lives at school, school nurses, a branch of public health nursing, can take part and perform important activities and unique roles for children in coping with chronic diseases, meeting their complicated healthcare needs, facilitating their school adaptation, increasing school success, and preventing social withdrawal and introversion (7-9).

The American Nurses Association has stated that increasing studies show a positive relationship between school attendance and academic achievement in schools with school nurses (5-11). Hill and Hollis reported that elementary school students' learning time increased with the school nurse; otherwise, teachers spent an extra hour teaching (12). Even a study reported that for each US dollar invested in a school nursing



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program, society would gain benefits worth 2.20 US dollars (5). As a result, the employment of well-trained school health nurses in schools will contribute to the improvement of individual and community health (7-17).

Except for certain private and boarding schools, school nurses are not employed at schools in Turkey. In addition, Community Health Centers provide health services primarily individual follow-ups for children having chronic diseases and being accordingly in the need of follow-up (11,13,15). Therefore, current health services do not meet the need and are inadequate for the management of chronic diseases.

Objective

The population of children in Şanlıurfa is higher than those in other cities in Turkey such that every year approximately sixty thousand children start attending elementary school each year (3). Children generally start elementary school at the age of 5. Primary education lasts 4 years. However, to our knowledge, the prevalence of children with chronic diseases among elementary school children aged 5-12 years has not been reported to date. Based on this, the objective of this study was to determine the prevalence of chronic diseases and health conditions of students (aged: 5-12) enrolled at elementary schools in central Şanlıurfa. Thus, it was aimed to take a step forward in the management of chronic diseases.

Methods

Population and Sample

This research was designed as a descriptive and cross-sectional study. Şanlıurfa city center consists of three districts, namely Eyyübiye, Haliliye, and Karaköprü. There are 61 elementary schools and 214,558 students in these three districts. To determine the number of students with chronic diseases in each school which has usually 2,000-3,000 students, 158,445 students aged 5-12 years in a total of 45 elementary schools in central Şanlıurfa were screened for chronic diseases between September 2018 and June 2019. The percentage of students reached is 73.8% of the total population. No students with chronic diseases were identified in 22 schools. The sample comprised 125 students diagnosed with a chronic disease by a doctor in 23 elementary schools. Before the study, verbal consent was obtained from children with chronic diseases and written consent from their families. At the preliminary stage of the study, ethical approval was obtained from the Clinical Studies Ethics Board of Harran University (approval number: 02-01, date: 09.02.2017).

Data Collection Tools

Data were collected from both children and families via separate forms. The student form had three parts composed of a total of 27 questions. The first part was the Sociodemographic Information Form, which contained questions about students' age, sex, and socioeconomic status (13 questions). The second part was the Disease Process Evaluation Form, which included questions on the students' chronic disease, treatment, and course of treatment (10 questions). The third part covered questions on the evaluation of the school lives of the students (4 questions). Students filled out the children's form in the counselors room of the school by themselves. Only unclear points were clarified

by the researcher. The average time to answer the questions was 15-20 min. Other data were collected using the family form, composed of questions on the medications and health reports of the students from their families through face-to-face interviews at schools or telephone calls.

Statistical Analysis

The analysis of the collected data, descriptive statistics (frequency, percentage, mean, standard deviation) were used with the SPSS (Statistical Package for the Social Sciences) 23.0 software. Prevalence rates of chronic diseases were calculated on the basis of 100,000 students.

Results

In this study, a total of 158,445 students in 45 elementary schools located in the center of Şanlıurfa were screened for chronic diseases to determine the prevalence of children with chronic diseases among elementary school children aged 5-12 years and the number of students with chronic diseases was determined as 125 students diagnosed with a chronic disease by a doctor in 23 elementary schools. No students with chronic diseases were identified in 22 schools. Based on these data, the prevalence of chronic diseases was calculated as 78.89 per 100,000 [95% confidence interval (CI): 66.1-94.0].

According to Table 1, asthma was found to be the most prevalent chronic disease among the participants (n=37) with a ratio of 29.6%. Asthma was followed by epilepsy (n=18, 14.4%), hypertension (n=13, 10.4%), chronic renal failure (n=12, 9.6%), musculoskeletal diseases (n=10, 8%), and dermatological diseases and gastrointestinal diseases (n=9, 7.2%) (Table 1). Psychological diseases and endocrine diseases except diabetes are given in the section titled "other chronic diseases" (n=7, 6.4%) (Table 1). The prevalence of asthma was calculated as 23.35 per 100,000 children (95% CI 17.0-32.2), the prevalence of epilepsy was 11.36 per 100,000 (95% CI 7.0-18.3), and the prevalence of hypertension was 8.2 per 100,000 (95% CI: 5.0-14.0).

The mean age of the students with chronic diseases was 8.14 ± 1.285 years and 60.8% of them were 5-8 years old. While 40% of the students with chronic diseases were diagnosed between the ages of 1-4, 32% of the students were diagnosed younger than one year. 68.9% of the students pointed out that they had no knowledge about their diseases. 48% of the students stated that they were regularly taking medication for their chronic diseases. In addition, 75% of these students implied that the dose of medication was adjusted by their mother during school hours. As shown in Table 1, 76.8% of the participants did not follow their diet as a part of their treatment. Moreover, 63.2% of the students claimed that they did not take the necessary precautions for the illness at school, such as diet, activity, medication, etc.

Of the children with chronic illness, 52.3% indicated that their academic achievement was average (medium, Table 1). 24% of the students stated that they did not attend school and 64.5% of them stated that their diseases caused them to be absent from school (Table 1).

Examining the demographic data of the participants revealed that 56.8% of them were male, 48.8% had four or more siblings, and 72.0%

were raised in nuclear homes. Furthermore, it was found that 46.4% of the student parents were consanguineous marriages. 19.2% of the participants had a family member with a chronic disease (n=24) such that 75% of the participants had a mother, father, or sibling with a chronic disease. Hypertension and asthma account for 29.2% of the stated chronic diseases.

Table 2 shows the types of chronic diseases based on the sociodemographic characteristics of the participants. As seen in Table 2, 88.9% of the participants with dermatological diseases were female, and the majority of those with asthma (67.6%) and epilepsy (77.8) were male. As a result, the type of chronic disease varies depending on gender as shown in Table 2.

Discussion

One of the significant global health problems is chronic diseases that have negative effects on aged 5-12 years children's health and social and school life. Therefore, the determination of prevalence ratios and children's health conditions is of paramount importance for the management of chronic diseases to improve children's quality of life and increase academic performance. In this context, the study, which is the first in this field to the best of our knowledge, examined the prevalence of chronic diseases and health conditions in the elementary school population.

According to the results, the prevalence of chronic diseases was found 78.89 in per 100,000 children among elementary school students. Moreover, more than half of the participants stated that school is an obstacle to controlling illness and that they can not attend school because of their diseases. Considering these results, this study revealed that school nurses should be employed in schools for the protection and improvement of students' health, early diagnosis, follow-up, and monitoring of chronic diseases in schools. Engelke et al. (10) reported that a school nursing program for chronic diseases in the school environment was effective in both improving children's health and increasing their school success as well.

Among chronic diseases, asthma was found as the most prevalent chronic illness among the participants (n=37) with a ratio of 29.6%, and after that epilepsy, hypertension, chronic renal failure, musculoskeletal diseases, dermatological and gastrointestinal diseases were determined as common chronic illnesses (Table 1). Similarly, Miller et al. (5) found asthma as the most prevalent chronic disease among 5,102 students aged between 8-18 years. According to one researcher in Şanlıurfa, the prevalence of asthma and atopic diseases was significantly higher in children who have a family history of atopy, attend a central school, live in an apartment, have more rooms in their homes, and enjoy better economic conditions (18). Moreover, they reported that epilepsy, diabetes, food allergies, and hypertension follow asthma (5). According to the study by Yetiş (11), asthma was the second most common chronic disease among 234 primary school students in Turkey, while diabetes ranked first.

Male students showed a higher prevalence than female students (Table 1). As well as being male (19-23), exposure of male children to environmental factors more frequently, lack of knowledge of family members about chronic disease, use of coal as a means of heating in

winter months, and smoking by family members can lead to asthma.

Most of the participants with asthma, epilepsy, and dermatological diseases were members of nuclear families (Table 2). Children with chronic diseases from extended families have significantly more behavioral disorders than those from nuclear families (13,21). Recently, turning extended families into nuclear ones can cause this result in our study.

According to the findings, epilepsy was the second most prevalent chronic disease (14.4%, Table 1) and male students had a higher prevalence (Table 2). In a recent study, the prevalence of epilepsy in children and adolescents was determined to be approximately 0.7% (24). In another study, the prevalence of epilepsy in children was calculated as 0.69% (5). In research conducted on children aged between 0 and 16 years in Turkey, the prevalence of epilepsy was found to be 0.8% (25). Since epilepsy seizures are more frequent in children aged below 15 years in developed countries (5,24,26), school nurses can play a role in designing healthcare services and follow-ups for school-age children with epilepsy and offer healthcare services for preventing their psychosocial problems and raising the quality of their lives.

Table 1. Disease-related characteristics of the participants

Variables	n	%
Chronic diseases		
Asthma	37	29.6
Epilepsy	18	14.4
Hypertension	13	10.4
Chronic renal failure	12	9.6
Musculoskeletal diseases	10	8.0
Dermatological diseases	9	7.2
Gastrointestinal diseases	9	7.2
Anemia	6	4.8
Diabetes	4	3.2
Other diseases	7	6.4
Age of diagnosis		
Younger than 1 year	40	32.0
1-4 years	50	40.0
After 4 years	35	28.0
Regular use of medications		
Yes	60	48.0
No	65	52.0
Following a specific diet		
Yes	29	23.2
No	96	76.8
School achievement level		
High	28	25.7
Medium	57	52.3
Low	24	22.0
Absenteeism at school		
Yes	27	24.8
No	82	75.2

Table 2. Types of chronic diseases based on the sociodemographic characteristics of the participants

	Types of chronic diseases																	
	Anemia		Hypertension		Dermatological diseases		Gastrointestinal diseases		Diabetes		Musculoskeletal diseases		Asthma		Epilepsy		Other	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Sex																		
Female	4	66.7	5	38.5	8	88.9	6	66.7	2	50.0	3	30.0	12	32.4	4	22.2	10	52.6
Male	2	33.3	8	61.5	1	11.1	3	33.3	2	50.0	7	70.0	25	67.6	14	77.8	9	47.4
Age																		
5-8 years	5	83.3	7	53.8	4	44.4	7	77.8	2	50.0	8	80.0	23	62.2	9	50.0	11	57.9
9-12 years	1	16.7	6	46.2	5	55.6	2	22.2	2	50.0	2	20.0	14	37.8	9	50.0	8	42.1
The number of siblings																		
0-3	3	50.0	5	38.5	3	33.3	5	55.6	1	25.0	6	60.0	20	54.1	10	55.6	10	52.6
4 or above	3	50.0	8	61.5	6	66.7	4	44.4	3	75.0	4	40.0	17	45.9	8	44.4	9	47.4
Family type																		
Nuclear	5	83.3	7	53.8	8	88.9	7	77.8	3	75.0	6	60.0	25	67.6	16	88.9	13	68.4
Extended	1	16.7	6	46.2	1	11.1	2	22.2	1	25.0	4	40.0	12	32.4	2	11.1	6	31.6
School achievement level																		
High	1	16.7	2	16.7	1	16.7	2	28.6	0	.0	0	.0	13	40.6	3	18.8	6	33.3
Medium	3	50.0	8	66.6	3	50.0	3	42.8	3	100.0	6	66.7	16	50.0	7	43.8	8	44.4
Low	2	33.3	2	16.7	2	33.3	2	28.6	0	.0	3	33.3	3	9.4	6	37.5	4	22.2
Absenteeism at school																		
Yes	3	50.0	2	16.7	1	16.7	2	71.4	0	.0	2	22.2	9	71.9	3	18.8	5	27.8
No	3	50.0	10	83.3	5	83.3	5	28.6	3	100.0	7	78.8	23	21.1	13	81.2	13	72.2

n: Number, %: Percent

In this study, hypertension was identified as the third most prevalent chronic disease among the participants (10.4 %, Table 1). A previous study demonstrated the prevalence of hypertension in children aged between 6-11 years as 0.04% (27). Today, the prevalence of hypertensive diseases in children and adolescents ranges between 3% and 5%. Also, half of the adults with hypertension has this disease in their childhood (27,28). It is noteworthy mentioning that blood pressure tests performed by school nurses can enable the diagnosis of hypertension, take urgent measures, and stop its progression at an early stage.

One of the important findings of this study is that 46.4% of the participants with chronic diseases were born because of consanguineous marriage since consanguineous marriage in Şanlıurfa is quite common. Consanguineous marriages have a significant effect on the epidemiology of genetic diseases. Similarly, in a study conducted on 66 women whose parents were consanguineous, 13 women had chronic diseases (29).

Anemia and diabetes are among the chronic diseases that their prevalence constantly drops in children (30,31). Our study is compatible with the literature such that anemia and diabetes were at the bottom of prevalence rankings. However, recent studies showed that even though the prevalence of both anemia and diabetes (type 1) drops during childhood across the world, both diseases are still considered critical health issues in less developed and developing countries that have low levels of socio-economic welfare (29,30,31). Problems in school life such as inadequate health care, unhealthy nutrition, and restrictions arising from school rules may be a reason for this situation. School nurses can

make great contributions to overcome such disadvantages. In the study by Ayaz (31) (2014), 92.7% of the teachers stated that nurses should be employed in schools and 91.9% stated that the employment of nurses in schools would contribute to the health of students (31).

Study Limitations

In this study, 16 of 61 primary schools were not screened because the school principals did not accept them. One of the limitations of this study is to go to a school once and not include children who have been diagnosed later. The fact that counselors do not know children with chronic diseases is another limitation. An appointment was made from the school outside class hours for all student interviews. Therefore, the data collection process lasted longer than expected time. The results of this study can only be generalized to children with similar characteristics.

Conclusion

In summary, the prevalence of chronic diseases in 158,445 elementary school students was found to be 78.89 per 100,000 students in the study. Asthma, epilepsy, and hypertension were found to be the three most prevalent diseases. Additionally, students' health was determined below the desired and expected levels. Taking into account the results of this study, the employment of school nurses seems a necessity, especially in order to increase students' quality of life and school success. The employment of well-trained school health nurses in schools will contribute to the improvement of individual and community health. However, future studies are needed to determine the effects of school

nursing programs on the management of chronic diseases including in Turkey.

Ethics Committee Approval: At the preliminary stage of the study, ethical approval was obtained from the Clinical Studies Ethics Board of Harran University (approval number: 02-01, date: 09.02.2017).

Informed Consent: Before the study, verbal consent was obtained from children with chronic diseases and written consent from their families.

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Authorship Contributions

Surgical and Medical Practices: M.K., S.K., Concept: M.K., S.K., Design: M.K., S.K., Data Collection or Processing: M.K., Analysis or Interpretation: M.K., S.K., Literature Search: M.K., S.K., Writing: M.K., S.K.

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