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**Sistematik Derleme**

# Effectiveness of Peer Education in Disease Self-Management of School Children and Adolescents with Chronic Diseases: A Systematic Review

# Kronik Hastalığı Olan Okul Çocukları ve Adölesanların Hastalık Öz Yönetiminde Akran Eğitiminin Etkinliği: Sistematik Bir İnceleme

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**ABSTRACT**

**Background:** This systematic review aims to investigate the effectiveness of peer education in the self-management of schoolchildren and adolescents with chronic diseases.

**Methods:** This study examined Turkish and English studies in the literature. It included experimental and quasi-experimental studies published in PubMed, Cochrane, and EBSCOhost on the effectiveness of peer education given to children aged 7-18 years about self-management of their disease. As a result of the review, nine articles were included in the study. The results were tabulated and presented in a narrative.

**Results:** The studies included 1,890 participants between the ages of 7 and 29. Some of the studies administering programs identified as "peer education programs" reported that these programs improved self-management, quality of life, well-being, feelings of happiness, academic performance, pulmonary function, self-evaluation, social support, and general communication perceptions, as well as reducing like a teak undesirable behaviours and cost. However, some studies indicated that these programs were not effective in improving the skills of coping with pain, controlling emotions, perceiving social support, self-efficacy, health-care management, quality of life, and glycemic control.

**Conclusion:** The study results showed that peer education programs might facilitate children and adolescents in adapting to the chronic diseases in their life, increase their quality of life, satisfaction, self-management, and self-efficacy skills, improve healthy behaviours, and lessens the intensity of their bad moods and reduce hospital costs. It is recommended that pediatric nurses providing care for patients with chronic diseases learn and utilize peer education methods. Therefore, a more enjoyable education environment could be established, leading pediatric patients to participate and improve the effectiveness of these programs.

**Key words:** Adolescent, Child, Chronic Disease, Nursing, Peer education

**ÖZET**

**Giriş:** Çalışmanın amacı, kronik hastalığı olan okul çocuğu ve adölesanların hastalık öz- yönetimlerinde akran eğitiminin etkinliğini incelemektir.

**Yöntem:** Sistematik derleme türünde olan bu çalışma, Ekim 2017–Ocak 2018 tarihleri arasında Türkçe ve İngilizce literatürler taranarak yapıldı. Çalışmaya, 7-18 yaş grubundaki çocuklara verilen akran eğitiminin hastalık öz-yönetimlerine etkisi hakkında MeSH'e uygun anahtar kelimeler kullanılarak Pubmed, Cochrane ve EBSCOhost veri tabanlarında yayınlanan deneysel ve yarı deneysel araştırmalar dahil edildi. Tarama sonucunda konu ile ilgili olan dokuz makale araştırmaya alındı. Elde edilen bulgular tablolaştırılarak öyküsel (narrative) olarak sunuldu.

**Bulgular:** Çalışmaların toplam örneklem hacmi 1890 idi. Katılımcıların yaşları 7-29 aralığında değişmekteydi. Araştırmalarda ipeer2peer, akran mentörlüğü/desteği/liderliği, uzman akran mentörlüğü ve akran bileşenli kendini yönetim programlarının kullanıldığı görüldü. Akran eğitimi olarak belirtilen bu programların çocukların öz-yönetim, yaşam kalitesi/iyilik hali ve mutluluk hissi, akademik performansı, tik gibi istenmeyen davranışları, pulmoner fonksiyonu, kendini değerlendirme, sosyal destek ve genel iletişim algılarını geliştirdiği ve maliyeti azalttığı saptandı. Fakat bu programların uygulandığı bazı çalışmalarda ise kronik hastalığı olan çocukların ağrı ile baş etme, duygusal semptom kontrolü, algılanan sosyal destek, öz etkililik, sağlık bakım yönetim becerisi, yaşam kalitesi ve glisemik kontrol becerilerini geliştirmede etkili olmadığı belirlendi.

**Sonuç:** Akran eğitimi kronik hastalığı olan okul çocuğu ve adölesanların hastalıkları ile ilgili bazı durumları yönetmelerinde etkiliyken bazılarında etkisiz bulundu.

**Anahtar sözcük:** Adölesan, Çocuk, Akran eğitimi, Kronik hastalık, Hemşirelik

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## INTRODUCTION

Although chronic diseases vary by children and their developmental characteristics, they affect the daily life activities of all children. These children may frequently be hospitalized for medical care (Hockenberry and Wilson, 2015). Chronic diseases generally are a long disease process that does not heal spontaneously (Compas, Jaser, Dunn, and Rodriguez, 2012), adversely affecting these children's lives. These children may experience problems in education, choosing a profession, and peer relations because of frequent absences from school and having a disability requiring treatment (Sikorová and Polochová, 2014; Hockenberry and Wilson, 2015).

Adolescence differs from childhood or adulthood due to peer pressure, psychosocial development, and health care transition (Bitsko, Everhart, and Rubin, 2013; Hockenberry and Wilson, 2015). Adolescents may experience problems such as activity restriction, school absenteeism, deterioration of peer relations, worsening of disease symptoms, hospitalization, and anxiety due to the decrease in disease compliance and management (Lu et al., 2012; Bitsko et al., 2013; Hockenberry and Wilson, 2015)Peer and school relationships are essential for school children and adolescents. The acceptance and adaptation process of the disease may be prolonged and adversely affected for the child when peer relationships are impaired due to chronic disease (Hockenberry and Wilson, 2015). Children may fail to receive successful treatment, and there is a potential to harm themselves during this period. Therefore, helping children to adapt to the chronic disease process is essential and requires more scientific knowledge.

Children learn how to manage chronic diseases through communication and experience with their families, peers, health care workers, and others in society (Beacham and Deatrick, 2015). It is essential to facilitate diagnosis, treatment, and adaptation reliably to improve the outcomes and enhance the child's ability to manage the disease. Peer education benefits education and counselling services based on the importance of peer relations among school children and adolescents. Peer education is a process in which selected people coach their peers on personal, social, and academic issues and provide them with skills (Aladağ and Tezer, 2016). With peer education, false facts that children think are true can be corrected, and they can be supported in adopting favourable attitudes and healthy behaviours through interaction with peers (Abdi and Simbar, 2013; Ghahramani, 2015; Aladağ and Tezer, 2016).

Peer education effectively develops and encourages healthy behaviours based on the power of social interaction and similar roles among individuals (Abdi and Simbar, 2013). Children with chronic illnesses who peers guided may feel more comfortable doing things they cannot do when they are with an adult. Peers encourage each other and freely express their thoughts, so the cognitive load is shared, and what they learn from their peers can be internalized more easily (Newton and Ender, 2010; Abdi and Simbar, 2013).

Peer education is an effective model for counselling, individualized care, patient-centred knowledge, decision making, and self-management support (Ghahramani, 2015). This education process is a positive and favourable environment that facilitates learning in children and adolescents with chronic illnesses and develops their sense of responsibility for learning skills for self-management (Ahola Kohut et al., 2016). However, if the peers who provide peer education are school children or adolescents, they should be well-educated and supported and evaluated continuously as untrained peers sometimes can create problems (Ünver and Akbayrak, 2013).

Nurses can connect with these school children and adolescents more efficiently and effectively during the health care process using the peer education model. Nurses support the children in accepting the disease, adapting to their social life more accessible, and preventing their isolation from society. This also makes self-management more effective, reducing the nurses' professional workload (Hockenberry and Wilson, 2015).

There are studies examining the effectiveness of the peer education model among school children and adolescents with chronic diseases in managing their diseases in the international literature (Clark et al. 2010; Rhee, Belyea, Hunt,

Brasch and 2011; Jerson et al. 2013; Otim, Jayasinha, Forbes and Shah, 2015; Ahola Kohut et al. 2016; Oris et al. 2016; Stinson et al. 2016; Siew Mazzucchelli, Rooney and Girdler, 2017). However, no study was found on this subject in Turkey. This systematic review aimed to show the effectiveness of peer education models on the disease self-management of schoolchildren and adolescents with chronic diseases based on studies in international literature. The data obtained are expected to contribute to the nursing care services, and scientific research carried out in the future.

This systematic review aimed to investigate the effectiveness of peer education in disease self-management of schoolchildren and adolescents with chronic diseases. The research questions of the study are as follows:

1- What peer education models are used to facilitate the adaptation of children and adolescents with chronic diseases?

2- How effective are peer education models in promoting the adaptation of children and adolescents with chronic diseases?

## MATERIALS AND METHODS

### Type of research

This study was organized as a systematic review. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA Statement) were used to conduct this systematic review and write the research report (Moher et al., 2009).

### Literature review

Literature review, study selection, and data collection processes were conducted independently by the first (P.K.) and third researchers (H.C.) to reduce the risk of possible non-neutrality. The first researcher performed the quality assessment of the studies included in the systematic review. Data were collected by the second researcher (Z.K.), who also checked the quality assessment of the studies. In addition, to be able to perform all these procedures properly and successfully, three researchers (P.K., Z.K., H.C.) participated in a pilot study. This pilot study included reviewing, selecting articles, collecting data, and evaluating the quality of the articles. Ideas were shared, and disagreements were resolved through discussions during the session.

### Selection process and criteria for the studies

Full-text experimental and quasi-experimental studies examining the effect of peer education given to 7 to 18-year-old children and adolescents with chronic illnesses on disease self-management were included in the study. Complying with MeSH, the following keywords were indexed using PubMed (including MEDLINE), Cochrane, and EBSCOhost databases: "Education," "Counseling," "Tutoring," "Assisted Learning," "Learning," "Support," "Teaching," "Mentoring," "Peer Support," "Peer Education," "Peer Counseling" "Peer Tutoring," "Peer Assisted Learning," "Peer Learning," "Peer Teaching," "Peer Mentoring," "Chronic disease," "Chronic illness," "Age 7-12 and "Age 12-18". Studies conducted between 2010 and 2017 were reviewed (Table I).

Initially, 19 344 records were found. As a result of the review made according to the title and summary parts of the studies, 31 articles were obtained. Among the reasons for exclusion of these 31 articles were the age, year, and type of study. The repeated records were excluded, and 19 full-text articles were examined according to the selection and exclusion criteria below. Then nine studies were included in the review. Figure I shows the procedure followed in selecting the articles.

The studies were reviewed according to the following criteria:

(1) The study group: School children and adolescents with a chronic disease

(2) Intervention: Peer education

(3) Comparison: Healthy school children and adolescents or school children and adolescents with a chronic disease

(4) Results: Self-management and adaptation

(5) Study Design: Experimental and quasi-experimental studies

The review did not include descriptive, case-control studies conducted with healthy children.

**Data collection**

Data were collected using a data collection tool developed by the researchers. This data collection tool allowed the researchers to obtain information about the methods of the studies, how these studies collected data, where the study was conducted, what interventions were applied, sample size, age of the participants, the group characteristics, and their results.

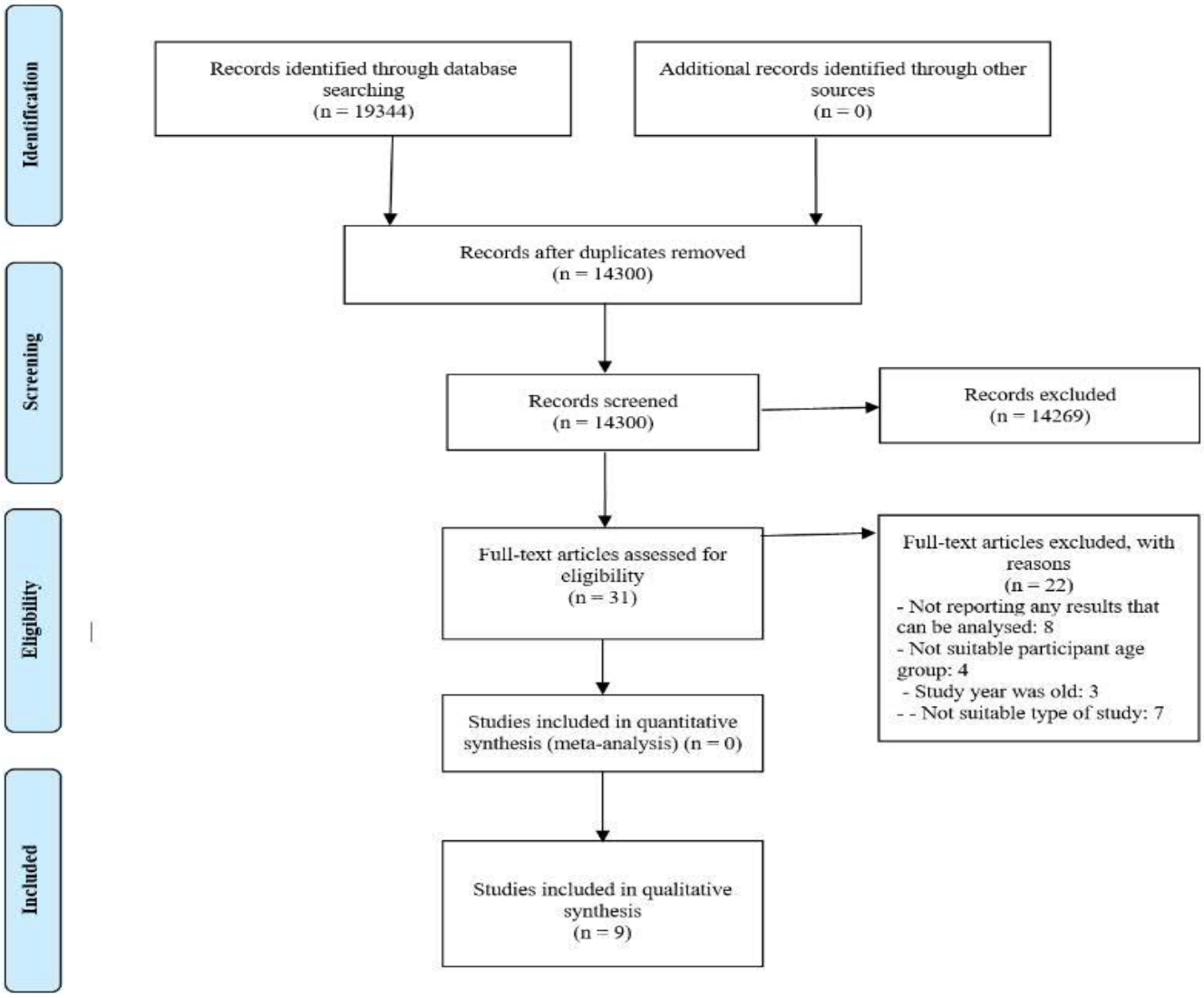


**Figure 1** PRISMA flow diagram of the search process

**Assessment of methodological quality of the studies**

The quality assessment of the four randomized-controlled studies was conducted using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Randomized Controlled Trials (Peters et al., 2015). The checklist consisted of 13 items, and each item was evaluated with "Yes," "No," "Unclear," and "Not Applicable (NA)." The assessment criteria of the checklist in this study were as follows: "low-risk weaknesses" when 1-3 items were checked as "No/Unclear"; "medium risk weaknesses" when 4-6 items were checked as "No/Unclear" and "high-risk weaknesses" when 7-13 items were checked as "No/Unclear." The quality assessment of five quasi-experimental studies was carried out using JBI Critical Appraisal Checklist for Quasi-Experimental Studies (non-randomized experimental studies) (Peters et al., 2015). This checklist consisted of nine items, and each item was assessed with "Yes," "No," "Unclear," and "Not Applicable (NA)." The assessment criteria of the checklist in this study were as follows: "low-risk weakness" when 1-2 items were checked as "No/Unclear"; "medium risk weaknesses" when 3-5 items were checked as "No/Unclear" and "high-risk weaknesses" when 6-9 items were checked as "No/Unclear."

### Data analysis

The methodology, characteristics of the participants, assessment methods, and outcome variables of the studies included in the systematic review varied. Therefore, a meta-analysis could not be conducted, and the findings were tabulated and presented as a narrative.

## RESULTS

### Searching results

Figure I shows the process of this systematic review and how the studies were selected. At the first stage of the review, 19.344 records of the articles were obtained. Repeated records were excluded and were selected based on their titles and abstracts. Then 19 possible studies for the systematic review were obtained. The full texts of these studies were examined, and nine articles investigating the effectiveness of peer education were included in the systematic review.

### Characteristics of the studies

The studies were published between 2010 and 2017; four were experimental, and five were quasi-experimental. The distribution of the studies by country was as follows: four were conducted in the United States, two in Australia, two in Canada, and one in Germany. Four studies were carried out at a school, two at a Level three hospital, one at a medical centre, one at a camp, and one at a children's clinic. The total sample size of the studies included 1,890 children, and each study's sample size ranged from 3 to 1,292. The participants were in the 7-29 year age range. The distribution of the studies according to the diseases of the participants was as follows: two studies were conducted with children with autism, two were conducted with children with asthma, one was conducted with children with a probability of asthma, one was conducted with children with chronic pain, one was conducted with children with type 1 diabetes and congenital heart disease, one was conducted with children with juvenile idiopathic arthritis and one was conducted with children who received a liver transplant operation (Table 1).

### Peer-education models used in the studies

The studies included in the systematic review were found to have used six different peer education programs/models. Among the studies, two used online peer mentoring (iPeer2Peer), two used peer support, one used peer mentoring, one used expert peer mentoring, two used peer leadership, and one used a peer-assisted self-management program (Table 1).

### Assessment of methodological quality

The assessment of methodological quality using the JBI Critical Appraisal Checklist showed that six of the studies were found to have "low-risk weaknesses," and three had "medium-risk weaknesses."

### Effectiveness of peer education programs

The iPeer2Peer program, which was used in the studies conducted with participants with chronic and painful juvenile idiopathic arthritis, improved the self-management of the adolescents but did not affect coping with pain, controlling emotions, perceiving social support, or self-efficacy (Ahola Kohut et al., 2016). The study showed that interventions defined as peer mentoring, peer support, and peer leadership improved self-evaluation, quality of life/well-being, and self-management of adolescents positively. Additionally, it reduced costs, improved lung function in children with asthma, and reduced undesirable behaviors in children with autism (Rhee et al., 2011; Jerson et al., 2013; McCurdy and Cole, 2014; Otim et al., 2015). Peer-assisted self-management programs improved academic achievement and self-management skills. Expert peer mentoring increased social support and general communication perception, academic achievement, and feelings of happiness (Clark et al., 2010; Siew et al., 2017). However, some studies included in the systematic review showed that these programs were not effective in improving health care management skills, quality of life, social support, and glycemic control (Jerson et al., 2013).

When the studies included in the systematic review were examined, it was found that peer education improved self-management in all children and adolescents. Still, it was not effective on disease-specific self-efficacy, pain, and quality of life, regardless of country and disease type.

**Table I. Characteristics of the Studies Included in the Systematic Review**

| Authors (year) | Research method | Data collection tool | Country | Intervention | Study area | Sample size | Mean age, year (SD) | Characteristics of the group | Primary Results |
|---|---|---|---|---|---|---|---|---|---|
| Ahola Kohut et al. (2016) | Randomized controlled trial | SSI, RPI, BAPQ, MSPSS, SMSAG, PSEQ, PCQ, HRQOL, DBSC | Canada | Online peer monitoring (iPeer2Peer) | Level 3 hospital | Experiment: 12<br>Control: 16 | 14±1.6 (12-18) | Chronic pain | Online peer monitoring (iPeer2Peer)<br>- Improved self-management.<br>- Did not affect pain, emotional symptoms, perceived social support, and self-efficacy. |
| Jerson et al. (2013) | Quasi-experimental | HRQOL | The USA | Peer mentoring | Medical Center | Experiment: 9<br>Control: 13 | 16-29 | Liver transplantation operation | Peer mentoring program<br>did not improve health care management skills and quality of life |
| Oris et al. (2016) | Quasi-experimental | NRI, IPPA, YS-R, OS-IQ, GC | Germany | Peer support | Pediatric health care clinic | Experiment: 109<br>Control: 119 | 13.9±1.28 | Type 1 diabetes and congenital heart disease<br><br>Healthy check-ups | Peer support program<br>improved self-evaluation and well being<br>- Did not affect social support and glycemic control. |
| Otim et al. (2015) | Quasi-experimental | Questionnaire | Australia | Peer leadership | School | 165 students | 11-12 | Asthma | Peer leadership<br>- Improved self-management.<br>- The decreased cost of asthma. |
| Stinson et al. (2016) | Randomized controlled trial | RPI, MEPS, CAS-E, HRQOL | Canada | Online peer monitoring (iPeer2Peer) | Level 3 hospital | Experiment: 16<br>Control: 14 | Experiment: 14.11±1.53<br>Control: 14.42±2.04 | Juvenile idiopathic arthritis | Online peer monitoring (iPeer2Peer)<br>- Improved self-management.<br>- Did not improve pain management, self-efficacy, and quality of life. |
| Clark et al. (2010) | Randomized controlled trial | Questionnaire, PAQLQ, DPSSOTE | The USA | Peer-assisted self-management program | School | 1,292 students | 10–13 | Probability of asthma | Peer-assisted self-management program<br>- Increased academic achievement and self-management. |
| Rhee et al. (2011) | Randomized controlled trial | TCAAS, PAQLQ, FEV1, FEV1/FVC | The USA | Peer leadership | Asthma camp | Experiment: 59<br>Control: 53 | Experiment: 14.86±1.35<br>Control: 14.53±1.3 | Asthma | Peer leadership program<br>- Increased self-management, quality of life, and pulmonary function. |
| McCurdy et al. (2014) | Pre-test and post-test check | IOA, PSQ | The USA | Peer support | School | 3 | Aged around 7, 8 and 11 | Autistic | Peer support program<br>- Undesirable behaviors decreased |
| Siew et al. (2017) | Pre-test and post-test check | AMAS-C, SPS, SCAM, SPCC, PRCA-24, CSQ | Australia | Expert peer mentoring | School | 10 | 17-20 | Autistic | Expert peer mentoring program<br>- Increased social support and general communication perception, academic achievement, coping skills, and feelings of happiness. |

AMAS-C: Adult Manifest Anxiety Scale-College Version, BAPQ: Bath Adolescent Pain Questionnaire, CAS-E: Children's Arthritis Self-Efficacy, CSQ: Client Satisfaction Questionnaire, DBSC: Developmentally Based Skills Checklist, DPSSOTE: Detroit Public Schools System Office of Testing and Evaluation, GC: Glycemic Control, HRQOL: Health-related quality of life, IOA: Interobserver Agreement, IPPA: Inventory of Parent and Peer Attachment, MEPS:, PCQ: Pain Coping Questionnaire, MSPSS: Multidimensional Scale of Perceived Social Support, OS-IQ: Offer Self-Image Questionnaire, PAQLQ: Pediatric Asthma Quality of Life Questionnaire, PRCA-24: Personal Report of Communication Apprehension, PSEQ: Pain Self-Efficacy Questionnaire, PSQ: Peer Supporter Questionnaire, SCAM: Situational Communication Apprehension Measure, SMSAG: Self-Management Skills Assessment Guide, SPCC: Self-Perceived Communication Competence Scale, SPS: Social Provision Scale, RPI: Recalled Pain Inventory, TCAAS: The Children's Attitude toward Asthma Scale, YS-R: Youth Self-Report, SSI: Semi-Structured Interview, NRI: Network of Relationships Inventory, FEV1: Forced Expiratory Volume, FVC: Forced Vital Capacity.

## DISCUSSION

In this systematic review investigating the effectiveness of peer education in disease self-management of school children and adolescents with chronic disease, the results regarding 1,890 children included in nine studies were presented.

The study indicated that peer education programs were defined as i) online peer mentoring (iPeer2Peer), ii) peer mentoring, iii) peer support, iv) peer leadership, v) expert peer mentoring, vi) and peer-assisted self-management programs. Similar to this study, other studies reported that peer support and peer leadership education programs had been used (Al-sheyab, Crisp and Shah, 2012; Stinson et al., 2014; Breithaupt, Eickman, Byrne and Fischer, 2017; Zhong and Melendez-Torres, 2017). These results are significant as they indicated that similar peer education programs using different names were utilized in the care and management of children and adolescents.

This study showed that these programs improved children's self-management skills, quality of life/well-being, happiness, academic achievement, lung functions, self-assessment, social support, and general communication perceptions but reduced undesirable behaviors and costs. As a result of a qualitative study conducted with adolescents with chronic pain in the 14-18-year range, Stinson et al. (2014) reported that peer support programs increased pain self-management skills. Clark et al. (2010), the peer-assisted self-management program they applied to children with asthma aged 10-13, increased academic achievement and self-management of the participants.

Conversely, other studies found that these programs, referred to as peer education programs, were ineffective in coping with pain, controlling emotions, perceiving social support, self-efficacy, health care management skills, quality of life, and glycemic control in children with chronic disease.

In a systematic review, Zhonk and Melendez-Torres (2017) reported that peer leadership self-management program was ineffective in improving lung function or quality of life in adolescents with asthma. Aladağ and Tezer (2016) noted that peer education would not be effective unless administered according to determined standards, ethical principles, and guidelines. Based on these results, it could be argued that the effectiveness of these programs may change depending on the characteristics of the people who provide peer education and the standardization of the education.

The results of assessing the methodological quality of the studies included in this systematic review were satisfactory. This is significant as it shows that this systematic review presented strong evidence.

## CONCLUSION

This systematic review showed that peer education programs were effective for school children and adolescents with chronic diseases in managing some related conditions, but they were ineffective in other situations. It was found in most studies that peer education programs improved self-management skills, quality of life, well-being, academic achievement, lung function, healthy behavior, social support, and self-perception of school children and adolescents with chronic diseases, as well as decreasing costs. However, in some studies, peer education programs did not have any effect on coping with pain, controlling emotions, perceiving social support, self-efficacy, health care management skills, quality of life, and glycemic control skills of children and adolescents.

Diversity of the peer education methods and results used in the studies showed that more experimental studies, in which the effectiveness of peer education programs are developed based on a particular rule and the effectiveness of different programs are compared, are needed.

Nurses have important responsibilities in the organization of peer education groups, education of education groups, and monitoring education results (Hockenberry and Wilson, 2015). However, in the studies included in this systematic review, people such as nurses, psychologists, and speech therapists, plan and conduct peer education. In peer education, the educator and the participants have similar statuses and the same disease. This may be more effective in understanding and internalizing the information conveyed by the participants. Nurses can reach children and adolescents more easily thanks to the disease education they plan by taking advantage of the power of peer education. n addition, since

these programs do not have any negative effects, nurses and trainers managing children with chronic diseases are advised to use these programs to improve their ability to cope with the diseases by using the interaction power of children.

The programs used in peer education were identified and defined under different names in the studies, and their results were evaluated according to various criteria. Therefore, a meta-analysis could not be carried out, and the results were presented as a narrative. The sample size of the five studies included in the systematic review was small. This may reduce the power of evidence of the results of the studies.

**Ethics Peer-review:**

Externally peer-reviewed.

**Conflict of Interest:** I am a partner, and my partners have had no potential conflict of interest.

**Financial Disclosure:** I and my partners have had no relevant financial interests.

Concept: P.K., H.C., Design: P.K., Z.K, H.C., Data Collection or Processing: P.K., H.C., Analysis or Interpretation: P.K., H.C., Z.K., Literature Search: P.K., H.C., Writing: P.K., H.C., Z.K.

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