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The impact of continuity of care on quality of life in children with asthma

A literature review

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Abstract

Aim: To describe the impact of continuity of care on the quality of life in children with asthma.

Methods: This is a descriptive literature review, which includes qualitative research on the changes in the quality of life of asthma children aged 0-18 years under the influence of nursing continuity. The two authors ultimately searched for 9 matching articles using PubMed and Cinahl and analyzed and summarized the data through a literature review.

Results: Through the summary and analysis of the selected 9 articles, it was found that continuity of care has a certain positive effect on improving the quality of life of children with asthma.

Discussion: The results of this review indicate that continuity of care may be positive and effective in improving the quality of life of children with asthma. Nurses can develop plans based on the different situations of different patients, carry out different forms of continuity of care, and propose specific intervention measures to make the continuity of care more specific, thereby better improving their quality of life.

Keywords: Continuity of care; Quality of life; Children with asthma.

1 Introduction

1.1 Background

According to GINA(Global Initiative for Asthma)(2004), there are nearly 300 million Asthma patients in the world, regardless of age, gender and race(Lemanske et al,2006). Asthma is most common in childhood compared to other chronic diseases(BAI et al,2010) .At present, the incidence of asthma in children in some Western countries is stable or even declining, while China is gradually increasing in recent years(BAI et al,2010). In China, due to the improvement of economic level driven by urban development and environmental changes in recent years, there is a gap in the prevalence rate of children with asthma between urban and rural areas. In addition, in rural areas, poor medical infrastructure, less social support and low attention have significantly widened the gap(Wen-Jing et al,2015). As a nursing model, continuity of care plays an important role in the management of many chronic diseases, and has been recognized as an important part of asthma disease management internationally in recent years(Cyr et al,2006). In the 1950s, continuity of care emerged and developed abroad(Uijen et al,2012). For example, Japan has established a comprehensive nursing service system based on the community, which can meet the daily needs of patients and improve their quality of life(Kayama & Doyle,2020). However, the study of continuity of care has only gained attention in China in recent years.In Hong Kong, transitional care schemes have been introduced to improve patients' sense of self-efficacy(Wong et al,2005). The nursing effect of continuity of care can be assessed by the quality of life as a standard to assess the health status of patients(Wilson et al,2012). Therefore, in order to further determine the quality of life of children with asthma, we will focus on the study of continuity of care.

1.2 Definition of Continuity of care

Traditional continuity of care refers to patients visiting the same doctor regularly(Cyr et al,2006). But over time, the concept of continuity of care has been supplemented by more researchers.Transitional care is defined as a series of actions taken to enhance coordination and continuity of health care as patient needs, location, etc., change(Lindquist et al,2017).Continuity of care includes three aspects: information continuity,management continuity and relationship continuity(Mendes et al,2017).

Continuity of care can improve the quality of care, improve doctor-patient relationship, and promote patient health.WHO defines continuity of care as people's experiences of individual healthcare events that are coherent, interrelated, and consistent with their health needs and preferences over time(Lana et al,2019). In our literature review, we defined continuity of care as ensuring the continuity and coordination of care and health care when patients are transferred on the basis of routine care, patient-centered, and meeting the different needs of patients at different times and places.

1.3 Definition of Children with asthma

Asthma is a chronic inflammatory disease(Lemanske et al,2006). Childhood asthma is not a single disease but is caused by a variety of diseases, with different manifestations throughout childhood(Trivedi et al,2019), it's a reversible expiratory flow restriction(Horak et al,2016). The severity of childhood asthma is influenced by the duration of asthma, genetic environment, gender, and obesity(Trivedi et al,2019). Early on, wheezing is common, along with cough, shortness of breath, and chest pain(Trivedi et al,2019). The most common treatment is inhaled corticosteroids(Horak et al,2016).

1.4 Definition of Quality of life

Quality of life is one of the most important outcomes in assessing patients with chronic diseases(Cristian et al,2013). Initially, quality of life was considered complementary to the traditional concept of health and functional status, rather than a broad concept(WHO,1998). Later,WHO defined quality of life as an individual's perception of their place in life within the culture and value system in which they live, and in relation to their goals, expectations, standards and concerns(Cristian et al,2013). And quality of life is often used as an outcome measure for childhood asthma, to describe how does childhood asthma affect daily life(Miadich et al,2015). The World Health Organization Quality of Life (WHOQOL) project was developed in order to provide a reliable and effective questionnaire for assessing quality of life(Gau et al,2010).

1.5 Peplau's interpersonal relationship theory

Peplau's interpersonal relationship theory discusses the dynamic relationship between nurses and patients, and divides the relationship into four stages: recognition stage, determination stage, progress stage, resolution stage(Yang et al,2022). The theory contains four concepts: human,health,environment and nursing.Peplau stressed that

scientific research in nursing should focus on the patient and called for a harmonious atmosphere of mutual understanding and respect throughout the nurse-patient relationship(Hagerty et al,2017). Nurses play a variety of roles in this process, including the role of educator resource provider consultant spokesperson and leader(Yang et al,2022).Continuity of care process is also a process of communication through home visits, telephone follow-up, lectures, wechat interaction and a series of measures, have an impact on the quality of life of children with asthma, enhance the feelings between nurses and patients, so as to create a mutual respect and harmonious atmosphere.In short, the relationship between nurses and patients at various stages discussed in Peplau's interpersonal relationship theory is in line with our theme of continuity care.

Table1:Content of the Peplau's interpersonal relationship theory

Peplau's interpersonal relationship theory			
Recognition stage	Determination stage	Progress stage	Resolution stage
Nurses should treat patients with respect and a positive attitude.	Nurses act as health educator,resource provider,consultant and care provider to promote patients' perception of their health status.	Nurses provide feedback to patients to help them figure out what they're thinking.	Nurses teach patients to manage symptoms and promote recovery in a variety of ways.

①Recognition stage: When the children with asthma see a doctor for the first time, the nurses introduce themselves to the patients, explain the etiology and medication knowledge of asthma and the initial treatment plan, and establish health records for the children with asthma.

②Determination stage: Carry out continuous care for children with asthma outside the hospital, evaluate the cognitive level of children and parents with asthma to the disease through wechat telephone health lectures, follow-up health education, and other methods, and inform the factors causing it to pay attention to and the method of respiratory function exercise, and jointly establish the goal of disease control and self-management.

③Progress stage: In the continuity of care after a period of time, send professional nurses to follow-up, in-depth communication with the asthma children or relatives, provide them with professional guidance, improve asthma children or relatives timely and accurately identify an emergency ability, make them master correct use method for the treatment of

tools Self-management methods, improve medication compliance.The family members can feedback on the problems of asthmatic children to the nurse in time, and the nurse can answer the questions raised.

④Resolution stage: Regular follow-up visits or telephone visits should be made after asthmatic children's symptoms are well controlled, so as to strengthen their interpersonal skills and social adaptability.

1.6 The nurse's role

Nurses establish a good relationship with patients in the nursing process, pay close attention to patient's physical and psychological status, develop targeted and continuous nursing strategies, encourage patients to adhere to treatment, activate patients' cooperation, maintain a respectful attitude, and meet patients' nursing needs during treatment(Navaie-Waliser et al,2004). Due to the particularity of patients, nurses play a core role in effective psychological nursing communication with children with asthma to relieve their unhealthy emotions, create a friendly atmosphere, make children familiar with the hospital environment as soon as possible, and create a more convenient and high-quality environment for patients. In addition, nurses can also serve as an educational channel for children with asthma and their parents to carry out health education and continuous follow-up, introduce the relevant knowledge of the disease, to help them improve their quality of life(Navaie-Waliser et al,2004).

1.7 Problem statement

Most previous studies of asthma have been done in adults, not in children. Even in pediatric patients, few studies have looked at the impact of continuity of care on the quality of life of children with asthma. Children with asthma can not be effectively controlled because of long-term recurrent attacks and big mood changes. Therefore, the control of this disease not only requires doctors and nurses to develop a comprehensive plan of continuity of care but also requires the active cooperation of children and parents. Although the whole system of continuity of care is not perfect, some studies show that the current system has many advantages. For example, it can reduce the economic pressure of families, reduce emergency visits, reduce the hospitalization rate, and respond to emergencies in time, so as to improve the quality of life and reduce the economic and spiritual burden.

1.8Aim and research questions

-Aim: The aim of the study is to describe the impact of continuity of care on the quality of life in children with asthma.

-Research questions: How does continuity of care impact the quality of life of children with asthma?

2 Methods

2.1Design

The authors conducted a descriptive literature review(Polit & Beck, 2017) .

2.2Search strategy

The article was found through a search in PubMed and Cinahl databases with certain limitations, as shown in Table 1. The search terms used are Continuity of Care [Mesh], quality of Life [Mesh], and children with asthma, which are searched one by one and in different combinations. When combining search terms, the Boolean term AND and OR were used (Polit & Beck, 2017). Articles searched are limited to English articles of the last 10 years. The indexed search terms will be obtained from the titles of PubMed and Cinahl. In the preliminary search (see Table 2), we skimmed the titles and abstracts of 113 articles, selected 19 articles in PubMed and 5 articles in Cinahl, that is, finally selected 24 articles considered to be potentially interested in the literature review. Finally, after reviewing the entire article, it was determined that there are 9 remaining articles(see Figure 1).

Table 2.Results of preliminary database searches

Database + Date of search	Limits	Search terms	Number of hits	Potential articles (excluding doubles)
Medline via PubMed 2022-05-4	10 years, English	continuity of care (MeSH)	45840	
Medline via PubMed 2022-05-4	10 years, English	children with asthma(Free text)	24624	
Medline via PubMed 2022-05-4	10 years, English	quality of life(MeSH)	148507	
Medline via PubMed 2022-05-4	10 years, English	continuity of care (MeSH) AND children with asthma(Free text)	229	
Medline via PubMed 2022-05-4	10 years, English	continuity of care (MeSH) AND quality of life(MeSH)	7710	
Medline via PubMed 2022-05-4	10 years, English	children with asthma (Free text) AND quality of life(MeSH)	936	
Medline via PubMed 2022-05-4	10 years, English	continuity of care (MeSH) AND children with asthma(MeSH) AND quality of life(MeSH)	41	19
Cinahl 2022-05-4	10 years, English	continuity of care (MeSH)	13724	
Cinahl 2022-05-4	10 years, English	children with asthma(Free text)	7862	
Cinahl 2022-05-4	10 years, English	quality of life(MeSH)	169481	

Cinahl 2022-05-4	10 years, English	continuity of care (MeSH) AND children with asthma(Free text)	39	
Cinahl 2022-05-4	10 years, English	continuity of care (MeSH) AND quality of life(MeSH)	1354	
Cinahl 2022-05-4	10 years, English	children with asthma (Free text) AND quality of life(MeSH)	648	
Cinahl 2022-05-4	10 years, English	continuity of care (MeSH) AND children with asthma(MeSH) AND quality of life(MeSH)	11	5
				Total: 24

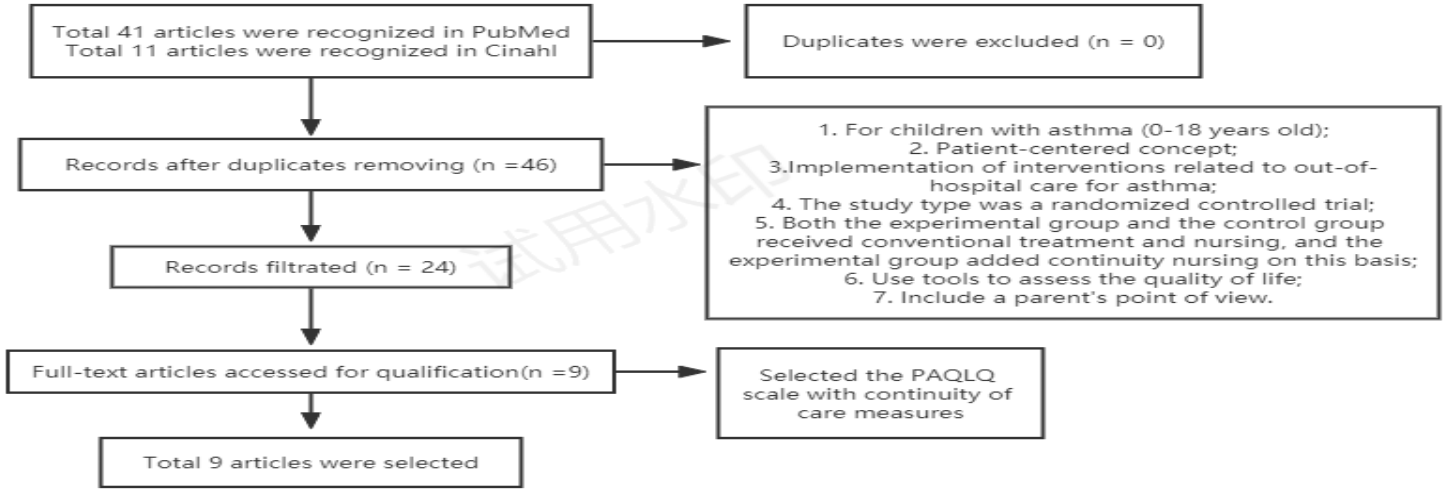

Figure 1. The flowchart of screening process

2.3 Selection criteria

Inclusion criteria: 1. For children with asthma (0-18 years old);2. Patient-centered concept;3.Implementation of interventions related to out-of-hospital care for asthma;4. The study type was a randomized controlled trial;5. Both the experimental group and the control group received conventional treatment and nursing, and the experimental group added continuity nursing on this basis;6. Use tools to assess the quality of life;7. Include a parent's point of view.

Exclusion criteria :1. Age beyond children; 2. No specific out-of-hospital intervention; 3. The study type was a non-randomized controlled trial;4. Only the abstract was obtained through various channels, but the full text was not obtained;5. The time is not 2012-2022;6. The language is not English.

2.4 Selection process and outcome of potential articles

Firstly, we conducted a preliminary screening from the PubMed database based on keyword searches, browsing titles, and abstract articles. Then, based on whether they were relevant for answering literature review research questions, we left 46 articles that were consistent with our topic. Subsequently, after carefully reading the content of the article, we selected 24 articles that we needed to be based on the exclusion and inclusion criteria. Finally, based on our research criteria, we selected the PAQLQ scale with continuity of care measures, and the remaining 9 articles met our standards.

2.5 Data analysis

For the article content studied in this degree project, the method we adopted was a summary analysis(Polit & Beck, 2017). After skimming the abstract and introduction of the article, which involves topics related to our topic, carefully read the results section to determine the impact of continuity of care, including specific measures and scales, on the quality of life of children with asthma. Abstract analysis is used to enhance understanding of nursing continuity and better evaluate the quality of life of children with asthma.

2.6 Ethical considerations

We read, evaluate and integrate these articles objectively, without being influenced by the author's own original opinions.The results did not change the author's original

wishes.There is no plagiarism in this degree program.The way the articles were obtained is legal.

3 Results

This literature review ultimately selected 9 studies on children with asthma that met the inclusion criteria, (Junhua CAO et al.2017; Gao, G et al.2020; Wester-gren, T et al.2016; Sanz-Santiago, V et al.2020; Kocaaslan, E. N., & Akgun Kostak, M.2019; Adama Brown, & Sharon D. Horner.2013; Bird SR et al.2012; Abramson MJ et al.2015; Latorre-Román PÁ et al.2014).

Selected articles described continuity of care interventions and illustrated the impact on the quality of life of children with asthma. The quality of life can be seen from all aspects, through our analysis of these articles, we categorize the impact of continuous care on the quality of life of children with asthma into three broad categories:1) improved asthma symptoms 2) improved physical activity 3) enhanced emotional communication. Continuity of care has a positive impact on the quality of life of children with asthma. Our results are in good agreement with the content of PAQLQ scores.

3.1 Improved asthma symptoms

In the process of continuity of care, medical professionals will take online and offline approaches, using books, telephone, and other ways to educate parents and patients about the disease, this way can improve asthma children's symptom control and reduce pain. Many children with asthma and their parents reported an increased number of hospital visits following their illness (Bird et al,2012).In fact, a better way to reduce emergency room visits and reduce the number of cases is to recognize and improve symptoms early. Professional medical staff will explain the disease through online and offline channels, including the causes of asthma attacks, treatment, nursing methods, emergency management and the use of inhalers, and other asthma-related knowledge.(Junhua et al,2017;Gao et al,2020;Kocaaslan et al,2019;Adama Brown, & Sharon D. Horner,2013;Bird et al,2012) Educational intervention is not only oral explanation but also relevant books and pamphlets distributed to parents and children, which are convenient for parents to consult at any time and help children understand the disease.(Kocaaslan et al,2019;Adama Brown, & Sharon D. Horner,2013) Through these

measures, many parents said that after understanding the relevant knowledge, they could better take care of their children and improve their asthma symptoms to some extent.

3.2 Improved physical activity

By providing exercise training to children with asthma, the children's asthma attacks can be controlled and their heart and lung function and muscle health can be improved. Due to uncertain factors such as the severity of the disease and the drug resistance of children with asthma, it is difficult to give a clear statement on improving the quality of life of children with asthma, and there is little difference in the data in the study comparison. However, the role of exercise intervention in improving the physical activity of children with asthma is beyond doubt (Sanz-Santiago et al,2020; Latorre-Román et al,2014). Combined exercise can effectively control asthma symptoms and cardiopulmonary health. Exercise intervention plays a role in the continuity of care to improve the cardiopulmonary function and exercise ability of children with asthma, thereby imperceptibly improving the quality of life of patients.

3.3 Enhanced emotional communication

Education and play are a strong guarantee of continuity of care, even if children and parents with asthma are not in the hospital, they can also get the same quality of care outcomes as in the medical unit, starting with improved mental state and progressing to improve the quality of life of children with asthma. Through these studies, we found that educational intervention was the most effective in enhancing emotional communication. Home visits and telephone follow-ups (Junhua et al,2017; Gao et al,2020; Adama Brown, & Sharon D. Horner,2013) could timely understand the asthma control situation and establish a good relationship with children and parents. Health lectures and nursing training (Junhua et al,2017; Gao et al,2020; Adama Brown, & Sharon D. Horner,2013; Bird et al,2012) are effective in improving the health-related quality of life of children with asthma as they serve as a bridge between health care and families with asthma. Children feel friendship in sports and games, develop independent character, learn to participate in social activities, and gradually overcome the past fear and other psychological (Westergren et al,2016; Latorre-Román et al,2014).

Table3. Overview of interventions and outcomes for selected articles

Authors	Title	Design	Intervention	Outcomes
Junhua CAO et al.2017	A Multi-center Study on Improve-ment in Life Quality of Pediatric Patients with Asthma-via Conti-nuous Care	Rando mized control trial	Establish files for each pediatric patient to record relevant information and provide routine discharge guidance. The intervention group received continuous treatment on the basis of the control group: first, join the wechat group that publishes health promotion every week. If you have any problems, you can put forward and complete the questionnaire to improve the treatment plan. 2.The intervention group received telephone follow-up every 10 days after discharge, and adjusted to once a month after 1 month. 3.Develop asthma health lectures and provide interactive links. 4.Carry out summer camp activities for children with asthma to understand the activity status and inducing factors of patients.	Twelve months after discharge, the ratio of forced expiratory volume in one second to FEV1% PEF in the intervention group was significantly higher than that in the control group. At 1, 3 and 12 months after discharge, the quality of life of the intervention group was significantly higher than that of the control group (P<0.05) through the comparison of the indicators of children's asthma quality of life questionnaire (PAQLQ). It suggests that continuity of care can improve the pulmonary function and quality of life of patients and effectively control asthma symptoms.
Gao, G et al.2020	A randomiz-ed controlled trial of a	prospec tive random ized	Data and medical files were established for the participants, and the control group received routine education only once. The intervention group received care provided by a clinical nurse with professional knowledge of pediatric	This article analyzes the difference between the nursed education pathway control group (NEP) and the childhood ashma control test (c-act) through repeated measurement variance to show the quality of life. The intervention group c-act included 7 items, including asthma symptoms induced by daytime and exercise, waking up due to asthma at night and self-report of asthma. The

	nurse-led education pathway for asthmatic children from outpatient to home	controlled trial	asthma care, and received work training of NEP (two outpatient clinics, one home visit and one telephone follow-up). Each visit has a specific education program, requiring nurses to complete all the programs planned for each visit, recording the reasons for not completing the programs, and providing customized problem interventions for patients.	potential range of the score is from 0 to 27, and the higher the score, the better the level of asthma control. According to repeated measures ANOVA, there was a statistically significant difference in HRQOL score between NEP group and control group in three periods (*P* =. 002), but there was no difference in all three time points (*P* =. 314). Therefore, it is concluded that the HRQOL score of the intervention group is improved more, thus improving the quality of life.
Wester-gren, T et al.2016	Active play exercise interven-tion in children with asthma: a PILOT STUDY	convergent parallel mixed-methods	1.Play intervention was performed twice a week, and children were used according to the doctor's recommendations β 2 agonists, and the exercise intensity was recorded. 2. Focus group interviews, including questions about experience and behavior in asthma intervention. 3.Observe participants on site and analyze data to improve measures.	A randomized controlled trial of active play exercise focusing on active play was conducted in asthmatic children. It was recorded by the pediatric asthma quality of life questionnaire (*P*AQLQ) to evaluate its impact on physical health, asthma control and health-related quality of life (HRQOL). Five children had *P*AQLQ scores ranging from 5.9 to 6.9 in the post intervention test, of which one child increased and one remained unchanged ≥ 0.5, which was the smallest clinically important difference in *P*AQLQ identified. Asthmatic children reported improved health-related quality of life after testing compared to baseline.
Sanz-Santiago, V et al.2020	Effect of a combined exercise program on physical fitness,	randomized controlled trial	The exercise intervention program lasted for 12 weeks, 3 days a week, a total of 36 times. The types of exercise used were resistance and aerobic, each lasting 60 minutes. Exercise intervention is personalized, and children with asthma wear monitors to assess exercise intensity.	The result of this study was to evaluate the changes of cardiopulmonary health, muscle strength, lung function, quality of life, asthma control and functional tests after 3 months of intervention. The level of asthma control in children and adolescents was assessed by act. The quality of life of the participants was assessed with the childhood asthma quality of life questionnaire (*P*AQLQ). The results of this study showed that combined exercise training (resistance and aerobic exercise) improved asthma, exercise symptoms were controlled, and

	lung function, and quality of life in patients with controlled asthma and exercise symptoms: A randomized controlled trial			children's cardiopulmonary health (f (8,51) = 2.5; *P* = .023; η*P*2 = 0.282) and muscle strength (leg press (*P* <.001; η *P*2 = 0.36), hamstring curl (*P* = .001; η *P*2 = 0.217), high row (*P* = .003; η *P*2 = 0.167), low row(*P* = .009; η *P*2 = 0.128) and quadriceps leg extension (*P* = .015; η *P*2 = 0.108)). However, after 3 months of intervention, no significant changes were found in quality of life and functional mobility.
Kocaaslan, E. N., & Akgun Kostak, M.2019	Effect of disease management education on the quality of life and self-	quasi-experimental, the one group pretest – posttest design.	To evaluate the quality of life and self-efficacy of asthmatic children, and then inform them of an asthma management education book. After 2 months of educational intervention, the quality of life and self-efficacy of children were re evaluated.	After education intervention, children's quality of life and self-efficacy were significantly improved (*P* = 0.014). The age of the mother, the number of brothers and sisters, the number of family members living in the same house, the activity status, the frequency of symptoms and their ability to use inhalers will all affect the quality of life of children. Children's age, their understanding of the factors leading to asthma and their ability to use drugs all affect their self-efficacy (*P* < 0.05).

	efficacy levels of children with asthma			
Adama Brown, & Sharon D. Horner.2013	Evaluating the effect of an asthma self-management intervention for rural families	Randomized controlled trial	The researchers conducted asthma self-management education intervention for children in the intervention group during school breaks, explained related knowledge to parents, followed up one month after the end of the intervention, issued a Home Asthma Plan booklet,and provided personalized guidance for problems.	The article evaluated quality of life, hospitalization and emergency department visits.*P*AQLQ was used to collect information, including three columns, including activity limitations, symptoms, and emotional functioning.The results showed that the total score of QOL(B=-0.61,$P<0.001$), activity QOL(B=-0.47, $P<0.035$) and emotional functioning QOL(B=-0.67, $P<0.001$) improved significantly over time during the process of individual growth.Scores for emotional functioning(B=-0.72,P=0.027) were higher in the treatment group.But over time, the gap between the treatment and control groups in terms of overall quality of life and its related dimensions will narrow, with no significant difference.There were no differences in gender, age, or asthma severity among the three ethnic groups in the study, but socioeconomic status may have played a role in the results. Whites have a higher socioeconomic status and a better quality of life than African Americans and Mexican Americans.
Bird SR et al.2012	Integrated Care Facilitation Model Reduces	Randomized controlled trial	Parents and children were given health education and a written action plan according to the Integrated Care Facilitation Model, and a range of services were provided and followed up.	The study compared emergency department presentations, admissions, and bed-days in children with asthma before and after recruitment.The pediatric asthma care givers quality of life questionnaire(*P*ACQLQ) or pediatric asthma quality of life questionnaire(*P*AQLQ) were used to assess changes in health and quality of life.The patients displayed a 57% reduction in ED presentations, 74% in admissions, and a 71% reduction in bed-

	Use of Hospital Resources by Patients with Pediatric Asthma			days. Whereas a comparator group displayed 27%, 32%, and 14% increases, respectively. Patients felt significant improvements after the intervention in quality of life dimensions of activity limitation(+5.6, $P<0.001$) and emotional function (+9.1, $P<0.001$).The split-plot ANOVAs showed a statistically significant and clinically important improvement (pre-vs.post intervention) in both activity limitation ($P<0.001$) and emotional function ($P<0.001$).
Abramson MJ et al.2015	Spirometry and Regular Follow-up do not Improve Quality of Life in Children or Adolescents With Asthma: Cluster Randomized Controlled Trials	Cluster Randomized Controlled Trials	This study conducted two grouped randomized controlled trials of spirometry in general practice in southeast Australia and recruited 238 asthmatic patients between the ages of 7 and 17 years who were randomly assigned to receive an intervention involving spirometry or usual care.	The main outcome measure of the study was asthma-related quality of life.Asthma related quality of life was measured with the Pediatric Asthma Impact Scale (*P*AIS) and Pediatric Asthma Quality of Life Questionnaire(*P*AQLQ).The mean difference in % predicted FEV_1 between the intervention and the control group was—1.17% [95%CI -4.32, 1.99; P=0.47], with the intervention group having slightly higher mean FEV_1.Neither trial found any difference in asthma related quality of life between groups. The intervention did not have any significant effect on asthma attacks,activities limitation, nocturnal coughing, bother during physical activity, worrying about asthma, or written asthma action plan.

Latorre-Román PÁ et al.2014	The effectiveness of an indoor intermittent training program for improving lung function, physical capacity, body composition and quality of life in children with asthma	Randomized controlled trial	The experimental group will undergo alternating high-and low- intensity exercise for 60 minutes, three times a week, for 12 weeks.	This study investigated the effects of indoor intermittent training on lung function, physical capacity, body composition, and quality of life in children with asthma.The study used *P*AQLQ to analyse the quality of life of asthmatic children.The results of *P*AQLQ questionnaire showed that there were statistically significant differences between experimental groups(EG) and control groups(CG) after and before the test ($P < 0.001$).It can be noted that EG showed a significant improvement in QOL relative to CG, as indicated by activity limitation, emotional functioning, symptoms, and *P*AQLQ total scale values.These results are consistent with other studies.Although there were differences before the test, the effect of the training program on these parameters was obvious, with EG(+59.76% for FEV6 and +84.52% for PEF) showing a greater improvement than CG(-30.57% for FEV6 and +13.51% for PEF).In terms of lung function, the training program performed in this study produced a significant improvement, indicating that intermittent training may be part of or an alternative to the treatment and rehabilitation of children with asthma.But the short-term effects of different training methods on lung function are controversial.

Table4. Data analysis of the impact of the control experiment on the quality of life in the selected articles

			Intervention groups			Control groups		
Authors	Design	Variable	Mean	SD	Total	Mean	SD	Total
Junhua CAO et al.2017	Randomized control trial	quality of life	90.28	10.35	86	82.73	8.86	86
Gao, G et al.2020	prospective randomized controlled trial	quality of life	74.8	10.0	73	76.4	5.7	52
Westergren, T et al.2016	convergent parallel mixed-methods	quality of life	/	5.9	10	/	6.9	10
Sanz-Santiago, V et al.2020	randomized controlled trial	quality of life	2.22	0.84	25	2.5	0.77	28
Kocaaslan, E. N., & Akgun Kostak, M. (2019)	quasi-experimental, the one group pretest–posttest design.	quality of life	113.51	18.39	62	104.75	19.62	62
Adama Brown, & Sharon D. Horner.2013	Randomized controlled trial	quality of life	1.74	0.60	81	1.69	0.60	72
Bird SR et al.2012	Randomized controlled trial	quality of life	/	/	331	/	/	331
Abramson MJ et al.2015	Cluster Randomized Controlled Trials	quality of life	/	/	144	/	/	94
Latorre-Román PÁ et al.2014	Randomized controlled trial	quality of life	4.21	1.33	58	4.32	1.55	47

4 Discussion

4.1 Main results

Through the analysis of the results of the collected literature, we concluded that continuity of care has a positive impact on the quality of life of children with asthma,which is mainly manifested in three aspects:1) Improved asthma symptoms 2) Improved physical activity 3) Enhanced emotional communication.However,there are also articles showing that after a period of intervention, the quality of life of children with asthma does not improve significantly(Sanz-Santiago et al,2020; Abramson et al,2015), and the reasons for this need to be explored by more follow-up studies.

4.2 Results discussion

The duration of these studies in the articles we selected is relatively short, and the results shown are not necessarily accurate. It can only be said that through long-term intervention, these measures may improve the quality of life of children with asthma. Moreover, intervention measures include many components, and it is difficult to determine which specific measures play a key role in improving the quality of life. Educational intervention(Junhua et al,2017; Gao et al,2020; Kocaaslan et al,2019; Adama Brown,&Sharon D.Horner,2013; Bird et al,2012) can often improve the ability of children and parents with asthma to understand the condition and identify symptoms, which is conducive to the development of treatment plans. Sports intervention(Sanz-Santiago et al,2020; Latorre-Román et al,2014) including game intervention(Westergren et al,2016) can understand the physical health and asthma control of children with asthma, so as to observe whether the quality of life is improved. In a word, the above-mentioned interventions, according to Peplau's theory, during the awareness period, nurses fully communicate with asthmatic children and their families to identify problems and seek solutions together. During confirmation, nurses and families of asthmatic children trust each other. Nurses motivate families of asthmatic children by participating in care programs. In the late stage, nurses took a variety of nursing measures for children with asthma to affect the patient's mental state and treatment enthusiasm. During the settlement, the nurse encouraged the asthmatic family to remain independent and expand the range of communication. The whole nursing process revolves around the interpersonal relationship between the nurse and the patient(Hagerty et al,2017). Our results also

support Peplau's theory and support a consideration based on Peplau's contribution to the family-related experience of nursing for children with asthma(Yang et al,2022). The interventions in the research articles are flexible, but understanding which part of the interventions is the most effective is a goal of future research.

4.3 Methods discussion

Our article is a descriptive literature review, which is summarized and combed through the analysis of previous research, and extends our evaluation(Polit & Beck, 2017). This is conducive to our research on the current situation of asthmatic children in writing avoids mistakes in recording during the research, and improves the accuracy of data. However, the selected literature is nearly ten years old and is required to be in English, so there are some limitations when reviewing the literature.

4.4 Clinical Implications and Importance

Our review found preliminary evidence of the impact of continuity of care on the quality of life of children with asthma. Continuity of care is a new nursing mode with patients as the core. It can meet the actual needs of asthmatic children and families by establishing patient files, making regular telephone follow-ups, exchanging real-time information, and conducting knowledge lectures, so as to improve the quality of life of asthmatic children. The project can raise people's attention to the continuity of care for children with asthma, and better improve the quality of life of children with asthma. Parents can learn about asthma and be able to respond to emergencies, thus reducing emergency rates and hospital admissions. It can cultivate nurses' comprehensive clinical thinking and has reference significance for clinical nursing work.

4.5 Suggestions for future research

Through this study, we found that more research is needed to determine the effective conditions of different intervention change projects in reducing asthma symptoms and improving quality of life. In future research, it will be very important to control the intervention time, because in the literature research we have collected, most of the time is limited to a few months. Perhaps increasing the intervention time is more significant for improving the quality of life data. And the effectiveness of the intervention is challenging, and there are many variables. Most of the studies on this topic are

concentrated abroad, and few are involved in Chinese Mainland at present. It is hoped that continuity of care can be more widely implemented in clinical practice in the future.

5 Conclusions

By comparing these articles, we conclude that continuity of care can have a positive impact on the quality of life of children with asthma. Although two articles do not support our conclusions, there are also reasons for unclear interventions. The improvement of the quality of life of asthmatic children depends not only on the attitude of parents but more importantly on the children. The caregiver or trainer should treat them as equals, and they will be more motivated to exercise and learn on their own when they feel joy and companionship. Through a series of measures such as telephone follow-up, games, sports training, and health education, the self-care ability of children with asthma and the family management ability of parents with asthma were improved. Continuity of care can help patients enjoy quality care outside the hospital, especially important for Chinese patients, can improve the quality of life of patients, and reduce pain and family burden. But the continuity of care in China has not been thoroughly studied, and some effective intervention measures are not many, in our opinion continuity care in China will have a better development prospect.

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APPENDIX 1

Table 5.Sample Summary of Selected Literature

#	Authors	Title	Design	Aim	Participants	Outcomes
1	Junhua CAO et al.2017	A Multi-center Study on Improve-ment in Life Quality of Pediatric Patients with Asthma- via Conti-nuous Care	Rando mized control trial	To analyze and summarize the effect of continuous care on the life quality and control of asthma of pediatric patients with asthma discharged from multiple hospitals.	Age:6-11; intervention group(IG):86; control group(CG):86.	Twelve months after discharge, the ratio of forced expiratory volume in one second to FEV1% PEF in the intervention group was significantly higher than that in the control group. At 1, 3 and 12 months after discharge, the quality of life of the intervention group was significantly higher than that of the control group (P<0.05) through the comparison of the indicators of children's asthma quality of life questionnaire (PAQLQ).
2	Gao, G et al.2020	A randomiz-ed controlled trial of a nurse-led education pathway for asthmatic children from outpatient to home	prospe ctive random ized control led trial	To evaluate the efficacy of a nurse-led education pathway, a standard educationprogramme , on children with asthma.	Age:4-14; IG:90; CG:90.	The intervention group c-act included 7 items, including asthma symptoms induced by daytime and exercise, waking up due to asthma at night and self-report of asthma. The potential range of the score is from 0 to 27, and the higher the score, the better the level of asthma control. According to repeated measures ANOVA, there was a statistically significant difference in HRQOL score between NEP group and control group in three periods (P =. 002), but there was no difference in all three time points (P =. 314).
3	Wester-gren, T et al.2016	Active play exercise interven-tion in	conver gent parallel mixed-	Increased physical activity (PA) may be beneficial for children with asthma.	Age:10-12; 4 boys, 2 girls.	Five children had PAQLQ scores ranging from 5.9 to 6.9 in the post intervention test, of which one child increased and one remained unchanged ≥ 0.5, which was the smallest clinically important difference in PAQLQ identified.

		children with asthma: a PILOT STUDY	method s			Asthmatic children reported improved health-related quality of life after testing compared to baseline.
4	Sanz-Santiago, V et al.2020	Effect of a combined exercise program on physical fitness, lung function, and quality of life in patients with controlled asthma and exercise symptoms: A randomi-zed controlled trial	random ized control led trial	To analyze the effects of a combined exercise training program on aerobic fitness, lung function, asthma control and quality of life in a group of mild-moderate asthmatic children with exercise symptoms.	Age:11.5 ± 2.6; IG = 25 ; CG = 28.	The results of this study showed that combined exercise training (resistance and aerobic exercise) improved asthma, exercise symptoms were controlled, and children's cardiopulmonary health (f (8,51) = 2.5; P = .023; $\eta P2$ = 0.282) and muscle strength (leg press (P <.001; $\eta P2$ = 0.36), hamstring curl (P = .001; $\eta P2$ = 0.217), high row (P = .003; $\eta P2$ = 0.167), low row(P = .009; $\eta P2$ = 0.128) and quadriceps leg extension (P = .015; $\eta P2$ = 0.108)). However, after 3 months of intervention, no significant changes were found in quality of life and functional mobility.
5	Kocaaslan, E. N., & Akgun Kostak, M. 2019	Effect of disease manage-ment education on the quality of life and self-efficacy levels of children with asthma	quasi-experi mental, the one group pretest – posttest design.	To determine the effects of disease management education provided to children with asthma on their quality of life and self-efficacy levels.	Age:10-18; IG:30; CG:30.	After education intervention, children's quality of life and self-efficacy were significantly improved (P = 0.014). The age of the mother, the number of brothers and sisters, the number of family members living in the same house, the activity status, the frequency of symptoms and their ability to use inhalers will all affect the quality of life of children. Children's age, their understanding of the factors leading to asthma and their ability to use drugs all affect their self-efficacy (P < 0.05).

6	Adama Brown, & Sharon D. Horner. 2013	Evaluating the effect of an asthma self-manage-ment interven-tion for rural families	Rando mized control led trial	To present the results of an asthma self-management intervention designed to improve rural parents' and children's work to manage childhood asthma.	Age:2-5 grade; IG = 101 ; CG = 82.	The results showed that the total score of QOL(B=-0.61,$P<$ 0.001), activity QOL(B=-0.47, $P<0.035$) and emotional functioning QOL(B=-0.67, $P<0.001$) improved significantly over time during the process of individual growth.Scores for emotional functioning(B=-0.72,P=0.027) were higher in the treatment group.But over time, the gap between the treatment and control groups in terms of overall quality of life and its related dimensions will narrow, with no significant difference.
7	Bird SR et al.2012	Integrated Care Facilitation Model Reduces Use of Hospital Resources by Patients with Pediatric Asthma	Rando mized control led trial	To promote health and reduce pediatric asthma patients' preventable and avoidable use of acute hospital services.	Age:5.1±4. 3;HARP(ho spital admissions risk programme)-asthma group:223; Comparator group:72.	After intervention,the patients displayed a 57% reduction in ED presentations, 74% in admissions, and a 71% reduction in bed-days. Whereas a comparator group displayed 27%, 32%, and 14% increases, respectively. Patients felt significant improvements after the intervention in quality of life dimensions of activity limitation(+5.6, $P<0.001$) and emotional function (+9.1, $P<0.001$).The split-plot ANOVAs showed a statistically significant and clinically important improvement (pre-vs.post intervention) in both activity limitation ($P<0.001$) and emotional function ($P<0.001$).
8	Abrams on MJ et al.2015	Spirometry and Regular Follow-up do not Improve Quality of Life in Children or Adolescents With Asthma:	Cluster Rando mized Control led Trials	To determine whether spirometry and regular medical review improved quality of life or other outcomes in children and adolescents with asthma.	Age:8-17; IG = 30 ; CG = 42.	The mean difference in % predicted FEV_1 between the intervention and the control group was—1.17% [95%CI -4.32, 1.99; P=0.47], with the intervention group having slightly higher mean FEV_1.Neither trial found any difference in asthma related quality of life between groups.

		Cluster Randomized Controlled Trials				
9	Latorre-Román PÁ et al.2014	The effectiveness of an indoor intermittent training program for improving lung function, physical capacity, body composition and quality of life in children with asthma	Randomized controlled trial	To analyze the effects of a 12-week indoor intermittent training program on lung function, physical capacity, body composition and quality of life in children with asthma.	Experimental group (EG, 58 children, age=11.55 ± 1.01 years);Control group (CG, 47 children, age=11.51 ± 1.42 years).	The results of *P*AQLQ questionnaire showed that there were statistically significant differences between experimental groups(EG) and control groups(CG) after and before the test ($P < 0.001$).It can be noted that EG showed a significant improvement in QOL relative to CG, as indicated by activity limitation, emotional functioning, symptoms, and *P*AQLQ total scale values.Although there were differences before the test, the effect of the training program on these parameters was obvious, with EG(+59.76% for FEV6 and +84.52% for PEF) showing a greater improvement than CG(-30.57% for FEV6 and +13.51% for PEF).