Original Article

A Study on Decreasing Asthma Attacks and Hospitalization: Discharge Training and Home Monitoring By Nurses

Ozlem Kackin, BSN, RN
Nurse, Department of Mental Health Nursing, Faculty of Health Sciences, Harran University, Sanlıurfa, Turkey

Selma Kahraman, PhD, RN
Assistant Professor, Department of Public Health Nursing, Faculty of Health Sciences, Harran University, Şanlıurfa, Turkey

Correspondience: Selma Kahraman, Harran University, Health High School Public Health Nursing 63050 Osmanbey Campus, Sanlıurfa e-posta: skahraman1308@gmail.comEmail:skahraman1308©gmail.com

Abstract

Background: Among childhood chronic diseases, the prevalence, mortality and morbidity of asthma is dramatically increasing around in world day by day. Asthmatic children often develop severe symptoms and asthma attacks. Prevention of asthma attacks plays a role in decreasing financial costs and increasing quality of life.
Purpose: Due to asthma attacks, the rates of emergency service consultation, hospital stay and medication use dramatically increase. This study aimed to investigate the effects of parental discharge training and home monitoring on asthma attacks, hospitalization and the quality of life.
Method: This quasi-experimental study was implemented on 128 mothers in Şanlıurfa in Turkey. Data were collected using two forms. Data analysis was done by SPSS 20.0 software using Mc Nemar test. $p <$ 0.05 and $p <$ *0.01* was considered statistically significant.
Results: Male gender, abdominal delivery, premature birth, smoking, coal and pet were found as risk factors. However, breastfeeding was found as protective. Discharge training decreased the ratio of asthma attacks (71.9 % to 21.2 %.). Besides, it decreased night cough, wheeze, phlegmy cough and cough accompanied with vomiting *($p <$ 0.05).* The frequency of emergency hospital admission for asthma decreased with discharge training from 63.3 % to 23.4 %.
Conclusions: Effective training of parents is important tool to prevent asthma attack, to manage asthma disease and to decrease financial costs of government. We found that discharge training in hospital and continuing these trainings by home visits were successfully decreased the number of asthma attacks and symptoms. nurse and health personnel should be aware of the importance of effective discharge training.

Keywords: Asthmatic child, Discharge Training, Home Visit, Parent, Public Health Nursing

Introduction

Among childhood chronic diseases, the prevalence, mortality and morbidity of asthma is dramatically increasing around in world day by day (Bavbek et al.,2003:38; Bozkurt &Yıldız, 2004:@102; Turkish Toraks Association, 2015). Asthma causes undesirable symptoms including severe wheezing, coughing, shortness of breath and trouble sleeping (Ekici, 2003:26). During asthma attacks, parents frequently apply to emergency service immediately. Hence, the rates of emergency service consultation, hospital stay and medication use increase. On the

other hand, asthma attacks result in a decrease in life quality of children and their parents (Theresa et al.,2017:437.). This study investigated the effect of discharge training and home monitoring program on asthma attacks, hospitalization and the quality of life. Our study aims to decrease repeated hospitalization and financial burden and to increase parent and child's life quality.

Background

Asthma is the most common chronic disease in children. Currently, the prevalence of asthma is gradually increasing in people by various factors including genetic factors, environmental pollution, poor domestic conditions etc. (Ekici & Cimete, 2015:160). According to WHO's report in 2015, 300 million people will be affected from asthma in the future (Global initiative for asthma [GINA], 2015). In Turkey, the asthma prevalence, calculated by ISAAC method, was found as 17.1 % (Bulduk & Esin, 2009: 24; Oddy et al., 2002:.66). Compared to the developed countries in East Europe and Asia, asthma prevalence in Turkey is high (Ones et al., 2006:1451).

Asthmatic children often develop severe symptoms and asthma attacks. Most parents immediately apply to emergency service to cope with these symptoms and attacks (Glick et al., 2017:.2). Asthmatic children sometimes stay in hospital for long period of time and/ or use medication consistently to overcome these undesirable experiences (Bavbek et al.,2003:40; Cihangir, 2007). Children cannot continue their education and make daily routines such as play, sports, nutrition, sleep or hygienic requirements (Ekici, 2003:27; Ekici & Cimete, 2015:159). Another point is quality of life of parents. Parents cannot go to work or make daily routines (Bavbek et al., 2003:40; Karmaus et al., 2008: 690; Thomas et al.,1996 866). Consequently, quality of life of children and parent decrease, even sometimes they get worse (Karagol et al., 2012:73; Kupczyk et al., 2010: 419). On the other hand, asthma attacks bring extra financial burdens to family and government (Nunes et al.,2017:3)

Prevention of asthma attacks plays a role in decreasing financial costs and increasing quality of life (Asthma Management Handbook. 2006; Ekici & Cimete, 2015:160). Parent and children training may be a solution to control asthma (Asthma Management Handbook. 2006, Basheti et al.,2018:6). Keeping away from asthma triggers and using non-medical applications may decrease in emergency service consultation, rehospitalisation and financial burdens (Cihangir, 2007:58). In this study, discharge training was given to parents as well as home visits were performed after three months. The effects of discharge training and home monitoring program were evaluated on asthma attack, hospitalization and quality of life.

Method

Study Design: This quasi-experimental study was planned to determine the effects of discharge training and home monitoring by nurses on asthma attacks, hospitalization and quality of life. The study was conducted in Şanlıurfa Pediatric Hospital between December 2014 and December 2015.

Sample: The study population was composed of all of parents with asthmatic child who stayed in hospital from December 2014 to March 2015. Parents were selected according to some criteria for their asthmatic child. The inclusion criteria were to stay in hospital, to be diagnosed with asthma by physician at least one year ago, to be between 0-18 age group and to have no other chronic disease. All parents agreed to participate in the study were mothers and 128 mothers participated into the study. After the mothers informed about the study, written consent of entering the study was taken from them. They were also informed that mothers may withdraw from the study at any part, if they do not want to continue.

Ethical Committees: Permission and ethical approval obtained from Hospital and University (Approval Number: 74059997.050.01.0/26) respectively.

Data Collection Tool: Data were collected using two forms. These forms were developed in accordance with the literature, asthma, and the opinions of immunology attending physicians. First form was composed of 32 close-ended questions about the socio-demographic characteristics of the mothers and their asthmatic child, possible causes of asthma and parental asthma knowledge. Second form, named as assessment form was composed of 13 close-ended questions about prevalence of asthma symptoms and asthma state. Before discharge training, mothers filled first form via face-to-face interview method. Mothers filled assessment form three times; before and after discharge training and during home monitoring using face-to-face interview method. Home monitoring was performed 3 months later than discharge training.

Discharge Training: Training booklet and presentation were developed using the literature and information obtained from first forms. Training

topics were basics of asthma, asthma-triggering factors / how to avoid them, symptom control, drug /action mechanism, inhalation technique, daily follow-up, diet, hygiene practices, home care, wear, exercise and things to do after discharging.

Each training group was composed of four mothers. Booklets were given to mothers before training. Training was planned as four session. The sessions were composed of presentation, videos, drug, non-medical applications and question-answers, respectively. The duration of training was minimum 70 minutes.

Home monitoring: Home monitoring was performed within the months of April, June and July; which asthma exacerbations are most likely to appear. Home visit was planned three months later than discharge training. One day ago, mothers was telephoned, informed and received their approval. During home visit, mothers trained for their misapplications and mothers' questions were answered.

Statistical Analysis: Data analysis was done by SPSS 20.0 software using Mc Nemar test. $P < 0.05$ and $p < 0.01$ was considered statistically significant.

Results

Possible Causes of Asthma: Possible causes of asthma determined using the answers in first forms are presented in Table 1. Most of the asthmatic children, who participated in this study, were male. However, asthma incidence was found high in female. As shown in Table 1, abdominal delivery was found very high (74.2 %) among asthmatic children. Apart from this, nearly half of children suffered from asthma, were born as premature. Ironically, the percentage of children who were breast-fed initially was found very low (15.6 %). Moreover, the percentage of children whose breastfed duration was less than 6 month was found very high (Table 1.)

Socio-demographic characters affecting asthma disease: Socio-demographic characters related asthma diseases were shown in Table 2. 58.6% of the children with asthma were between ages of 5 and 9. Most of the mothers were found as illiterate. Nearly all mothers did not know anything about asthma disease. When examined number of children in family, most of family had more than three children (Table 2). Almost all families had low income. The percentage of families, who use coal for heating home, was found as 49.2 %. The percentage of families, having pet in home was found as 61.7 % (Table 2).

The distribution of asthma attack symptoms before and after discharge training was presented in Figure 1. As shown in Figure 1, discharge training decreased the frequency of night cough, wheeze, phlegmy cough and cough accompanied with vomiting ($p < 0.05$). Training did not cause any change on the frequency of nasal congestion and cough with effort ($p > 0.05$). However, the frequency of dyspnea, sore throat and fever increased after discharge training (Figure 1).

Effects of discharge training on the asthma state, hospitalization and quality of life: When examined the number of asthma attack in last one month, discharge training decreased the frequency of the mothers who answered as 4-6 times ($p < 0.05$). Before discharge training, the frequency was found as 71.9 %. Contrary, after discharge training, it was found as 24.2 % (Table 3).

The discharge training also decreased the percentage of emergency hospital admission for asthma as first aid from 63.3 % to 23.4 %. Besides, the frequency of mothers, using steam inhalation as first aid increased with training (2.3 % to 22.7 %, $p < 0.05$, Table 3). Moreover, the ratio of children who woke up with cough in the morning as 3-6 times within last one month, decreased from 60.9 % to 29.7 % after discharge training ($p < 0.05$).

When examined the number of emergency service consultation and duration of stay in emergency service within 3 months, discharge training caused a decrease in the percentage of emergency hospital admission five- nine times and those more than ten times (Table 3). Similarly, discharge training increased the percentage of stay duration, which was less than one hour from 9.4 % to 57.0%.

Table 1. Possible Causes of Asthma

Possible Causes	Frequency	%
Gender		
Female	44	**34.4**
Male	84	**65.6**
Modes of Delivery		
Vaginal Delivery	33	**25.8**
Abdominal Delivery	95	**74.2**
Birth Weight		
< 2.000 g	48	**37.5**
2.000 -3.000 g	42	**32.8**
≥ 3.000 g	38	**29.7**
Initial food after birth		
Breast milk	20	**15.6**
Honey	28	**21.9**
Water with sugar	71	**55.7**
Others	9	**7.0**
The period of breast feed		
0-2 Month	81	**63.3**
3-5 Month	36	**28.1**
≥ 6 Month	11	**8.6**

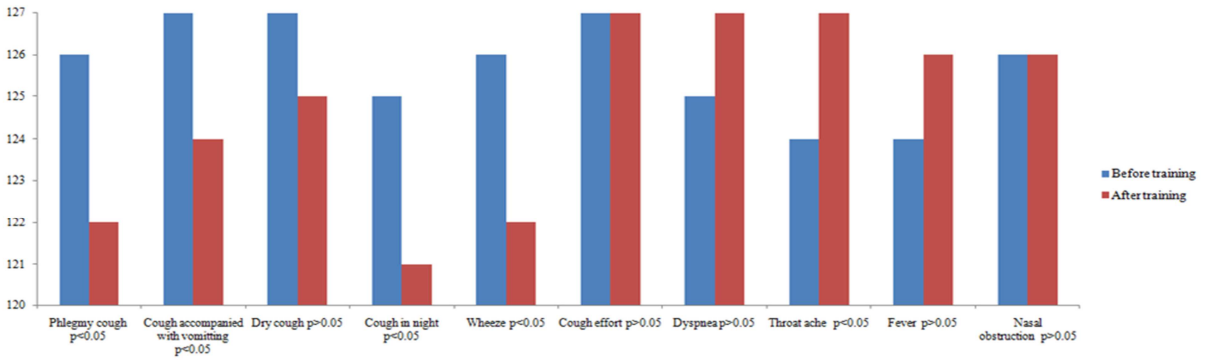
Table 2. Socio-Demographic Characters Affecting Asthma Disease

Socio-demographic characters	Frequency	%
Asthmatic child Age		
0-4	30	**23.4**
5-9	75	**58.6**
≥ 10	23	**18.0**
Mother Education Status		
Literate	36	**28.1**
Illiterate	92	**79.9**
Knowledge level about asthma		
No knowledge	117	**91.4**
Little knowledge	11	**8.6**
Number of children in family		
1-3	23	**18.0**
4-6	36	**28.1**
≥ 7	69	**53.9**

Monthly income of family		
Low Income	120	**95.8**
High Income	8	**6.2**
Type of home		
Apartment	25	**19.5**
Others	103	**80.5**
Heating system		
With Coal	63	**49.2**
Electrical	60	**46.9**
Others	5	**3.9**
Bedroom of asthmatic child		
With other child	95	**74.8**
Without other child	33	**25.8**
Is there any pet in home?		
Yes	79	**61.7**
No	49	**38.3**

The effects of discharge training on the asthma attack symptoms

Figure1. The Effects Of Discharge Training On The Asthma Attack Symptoms.



Before training, the ratio of hospitalizations within 3 months as five-nine times was determined as 56.8 % and those as more than ten times was found as 40.0 %. After training, the mentioned ratios decreased prominently (Table 3). The same results were found in the frequency of stay length in hospital (Table 3).

The frequency of wheezing which seen as more than ten times within 3 months decreased significantly after training. In addition, discharge training caused a decrease in the numbers of disturbed sleep and those of life activity limitation as same as wheezing ($p < 0.05$).The utilization of inhaler or salbutamol nebulizer within last month increased after discharge training (Table 3).

Table 3. Effects Of Discharge Training On Asthma State, Hospitalization And Quality Of Life

Variables	Before Training		After Training		
Asthma state, hospitalization and quality of life	**Frequency**	**%**	**Frequency**	**%**	***p***
Asthma attack within last month					***0,00***
0-3	30	**23.4**	89	**69.5**	
4-6	92	**71.9**	31	**24.2**	
≥ 7	6	**4.7**	8	**6.2**	
First aid during attack					
Emergency service	81	**63.3**	30	**23.4**	***0,00***
Steam inhalation	10	**7.8**	5	**39.1**	
To loosen tight clothing	3	**2.3**	29	**22.7**	
To give drug	15	**11.7**	13	**10.2**	
To hit the back	19	**14.8**	46	**4.7**	
How many times did child wake up with cough in the morning within last month?	22	**17.2**	84	**65.6**	***0,00***
0-2					
3-6	78	**60.9**	38	**29.7**	
≥ 7	28	**21.9**	6	**4.7**	
Number of emergency service consultation within 3 months					
1-4	7	**5.5**	80	**62.5**	***0,00***
5-9	73	**57.0**	35	**27.3**	
≥ 10	48	**37.5**	13	**10.2**	
Duration of stay in emergency service within 3 months					
<1 hour	12	**9.4**	73	**57.0**	***0,00***
1-3 hours	70	**54.7**	46	**35.9**	
> 3 hours	46	**35.9**	9	**7.0**	
Number of hospitalizations within 3 months					
1-4	16	**12.5**	69	**53.9**	***0,00***
5-9	72	**56.8**	50	**39.1**	
≥ 10	40	**31.2**	9	**7.0**	
Duration of stay in hospital within 3 months					
1-10 days	4	**3.1**	20	**15.6**	***0,00***
11-20 days	54	**42.2**	86	**67.2**	
≥ 20 days	70	**54.7**	22	**17.2**	
Frequency of wheezing within 3 months	2	**16**	24	**18.8**	***0,00***
0-4					
5-9	5	**3.9**	83	**64.8**	
≥ 10	121	**94.5**	21	**16.4**	
How many times was child's sleep disturbed because of asthma?					
0-4	3	**2.3**	17	**13.3**	***0,00***
5-9	8	**6.2**	86	**67.2**	
≥ 10	117	**91.4**	25	**19.5**	

Frequency of using inhaler or salbutamol nebulizer within last month					
0-4	0	**0.0**	20	**15.6**	***0,00***
5-9	4	**3.1**	85	**66.4**	
≥ 10	124	**96.9**	23	**18.0**	
How many times did asthma restrict life activities within a month?					
0-4	0	**0.0**	12	**9.4**	***0,00***
5-9	24	**18.8**	90	**70.3**	
≥ 10	104	**81.2**	26	**20.3**	

Discussion

Possible Causes of Asthma: Asthma is a complex multifactorial disease including genetic, individual and economic factors (Lees, 2013). In our study, we assessed possible causes of asthma disease and found that 65.6 % of asthmatic children were male (Table 1). Male gender as a risk factor for asthma has been associated with smaller airway and higher IgE score of male (Akcay et al.,2006:84; Akoglu et al., 2004:352). Our results are compatible with the results of Gurkan et al. (2012), Karagol et al. (2012) and Kuyucu et al. (2006). Abdominal delivery has increased risk of developing asthma in advanced age compared to vaginal delivery (GINA, 2015; Haahtela et al., 2001:810). According to our results, abdominal delivery is one of risk factors for asthma (Table 1). Retrospective studies suggested that premature babies face a higher risk of developing asthma. In the study conducted on 5.030 babies, the prevalence of asthma increases in especially premature babies and the risk for asthma becomes more apparent in newborns from mechanically ventilated (Khaled et al., 2009:138). Accordingly, other study conducted on 1.812 schoolchildren suggests that premature birth is a risk factor for repetitive wheezing, bronchitis and asthma (Karaagac et al., 2003:164; Karagol et al., 2012:73). In our study, the ratio of premature babies suffered from asthma was found 37.5 %. In our study, 91.4 % of asthmatic children fed with breast milk for less than 6 month. Also the percentage of children who were breast-fed initially was found very low (Table 1). Our results are compatible with the studies Oddy et al. (2002), Polatdemir et al. (2011) and Friedman et al. (2005). As a result, breastfeeding has importance to prevent to develop asthma.

Socio-demographic characters affecting asthma disease: Asthma knowledge and awareness is important tool to decrease asthma attacks (Esra et al., 2015:.99; Mutlu & Balcı, 2010:.82). Parental socio-demographic characters may be a predictor of asthma knowledge. In this study, most of mothers were found as illiterate and as having no asthma knowledge (Table 2). Education level and asthma knowledge affects life quality of asthmatic child (Kupczyk et al.,2010:415). The percentage of large families was highest in our study and most families had low monthly income (Table 2). In the literature, large families have no affect on the life quality of asthmatic children and the prevalence of asthmatic attacks (Yüksel & Yılmaz, 2009:88; Zeyrek, 2008:90). Considered with low income and family size together, the prevalence of asthmatic attacks may be high in such families because of home type, hygiene etc. Smoking at home is main cause of asthma attack (Karagol et al., 2012:73; Ones et al., 2006:1451). In our study, the percentage of smoking in family was found very high. Discharge training increased awareness of smoking and 4 mother among 128 mothers gave up smoking after training. Buchdal et al. (1996) found a strong relationship between asthma attack and ozone (O_3) and SO_2 concentration in air. Considered the percentage of families using coal as heating system (49.2%, Table 2), our results support the study by Buchdal et al.(1996). Having a pet is another risk factor for asthma (Zeyrek, 2008:90). In this study, the percentage of families having a pet was found as 61.7% (Table 2).

The effects of discharge training on the asthma attack symptoms: Mothers were informed about asthma, asthma-triggering factors / how to avoid them, symptom control, drug /action mechanism, inhalation technique, daily follow-up, diet, hygiene

practices, home care, wear, exercise in discharge training. During home visit, we observed that mothers tried to reduce children's exposure to asthma triggers as much as possible. For example, separate pet shelter, careful use of perfume and detergent, no smoking/ not smoking close to asthmatic child. Parental increased awareness and asthma knowledge resulted in a decrease the prevalence of symptoms including phlegmy cough, cough accompanied with vomiting, dry cough, cough in night and wheeze during asthma attack significantly (Figure 1). Our results are compatible with the literature (Basheti et al., 2018:7, Grover et al., 2016:82). No smoking or not smoking close to asthmatic child caused a marked decrease percentage of wheezes (Akçay et al., 2006:84; Pamukçu & Yoldaş, 2013:26).

Effects of discharge training on the asthma state, hospitalization and quality of life: As mentioned before, parental increased awareness and asthma knowledge with discharge training decreased the number of asthma attack (Table 3). Besides discharge training decreased the frequency of restricted life activities, those of disturbed sleep and those of wheezing. Considering all above finding, discharge training and home visit may contribute to increase the life quality of children and those of parents (Bateman et al., 2007:60; Bozkurt & Yıldız, 2004:109).

Apart from this, the percentage of emergency service consultation significantly decreased after discharge training in our study (Table 3). Besides, duration of stay in emergency service and hospitalization number decreased prominently. Similar results were reported in the study by Korenblat et al.(1995). By taking into account all these findings, discharge training and home visit may be important tool to decrease financial costs of hospital and government. Preventive medicine provides to control asthma. Therefore, medicine should be used regularly. In our study, the frequency of using inhaler or salbutamol nebulizer increased after discharge training. Moreover, during discharge training and home visit, misuse of medicine decreased. These results are similar to the results of the study by Thomas et al. (1996)

Study Limitation: Our limitation was that data were obtained from mothers' answers to questions.

Conclusion / Implications for Practice : In our study, male gender, abdominal delivery and premature birth were found as risk factors for asthma. Also we found that breastfeeding play a role on preventing asthma. One of our results is that low level of parental asthma knowledge decreased the life quality of asthmatic children. Smoking, coal and pet were found as triggers for asthma. We found that discharge training in hospital and continuing these trainings by home visits were successfully decreased the number of asthma attacks and symptoms. Discharge training and home visit contributed to increase the life quality of children and those of their parents. They also decreased the number of emergency service consultation, hospitalization rate and duration of stay in hospital and emergency service. In conclusion, effective training of parents is important tool to prevent asthma attack, to manage asthma disease, to increase the life quality of asthmatic children and to decrease financial costs of hospital and government. So, nurse and health personnel should be aware of the importance of effective discharge training.

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