Araştırma Makalesi

The Effect of Nurse-Led Home Visits to 3-Year-old Children Presenting with Fever on Their Development and Repeat Visits Emergency Department

Ateşle Başvuran 3 Yaşındaki Çocuklara Hemşire Eşliğinde Yapılan Ev Ziyaretlerinin Gelişimleri ve Acil Servise Tekrar Başvurmaları Üzerindeki Etkisi

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ABSTRACT

Objective: The aim of this study was to examine the effect of nurse-led home visits for 3-year-old children presenting to the emergency departments in with complaints of fever on their development and repeat emergency department visits.

Methods: This study adopted a quasi-experimental design in accordance with the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) checklist. The sample of the study consisted of a total of 62 3-year-old children, 31 in the intervention group (IG) and 31 in the control group (CG).

Results: The general development scores of the children in the intervention and control groups were nearly identical in the first month (IG: 122.42±4.5, CG: 123.45±4.0, p>0.05). However, in the third month, development scores were significantly higher in the IG (131.74±4.1) compared to the CG (124.19±3.8) (p<0.05).

Conslusion: The results obtained in the present study demonstrated the effectiveness of nurse-led home visits in reducing repeat emergency visits for children with fever complaints and in promoting the healthy development of children. To ensure a more robust evidence base, more research is warranted.

Keywords: Child, Development, Fever, Home Visit, Nurse

ÖZ

Amaç: Bu çalışmanın amacı, acil servislere ateş şikayetiyle başvuran üç yaşındaki çocuklara hemşire eşliğinde yapılan ev ziyaretlerinin çocukların gelişimi ve acil servis ziyaretlerinin tekrarı üzerindeki etkisini incelemektir.

Yöntem: Bu çalışmada, TREND (Transparent Reporting of Evaluations with Nonrandomized Designs) kontrol listesine uygun olarak yarı deneysel bir tasarım benimsenmiştir. Çalışmanın örneklemi, 31'i müdahale grubunda (GG) ve 31'i kontrol grubunda (KG) olmak üzere toplam 62 üç yaşındaki çocuktan oluşmaktadır.

Bulgular: Müdahale ve kontrol gruplarındaki çocukların genel gelişim puanları ilk ayda neredeyse aynıydı (IG: 122,42±4,5, KG: 123,45±4,0, p>0,05). Bununla birlikte, üçüncü ayda gelişim skorları IG'de (131,74±4,1) KG'ye (124,19±3,8) kıyasla anlamlı derecede daha yüksekti (p<0,05).

Sonuç: Bu çalışmada elde edilen sonuçlar, ateş şikayeti olan çocukların acil servise tekrar başvurmalarını azaltmada ve çocukların sağlıklı gelişimini desteklemede hemşire liderliğindeki ev ziyaretlerinin etkinliğini göstermiştir. Daha sağlam bir kanıt temeli sağlamak için daha fazla araştırma yapılması gerekmektedir.

Anahtar Kelimeler: Ateş, Çocuk, Ev Ziyaretleri, Gelişim, Hemşire

INTRODUCTION

One of the most common complaints in children is fever (Borensztajn et al., 2022; Burokienė et al., 2017; Iroh Tam et al., 2016; Karakaş et al., 2020; Waly & Bakry, 2022). Although fever is not recognized as a disease by the World Health Organization (WHO), it contributes to significant morbidity and mortality among children worldwide due to associated infectious causes (Iroh Tam et al., 2016; World Health Organization [WHO], 2023). Fever also causes panic in parents because it is a symptom that is seen in the majority of childhood diseases and is often the first sign to be recognized, thus significantly contributing to emergency department admissions (Akçay ve Özgür, 2022; Burokienė et al., 2017; Ma et al., 2019; Öztürk et al., 2015; Thota et al., 2018; Waly & Bakry, 2022; Wijaya et al., 2022; Yiğit & Sarıalioğlu, 2022). Studies conducted in Turkey and abroad have reported that the majority of visits to pediatric emergency departments are due to complaints of fever, and it has been indicated that at least 84.4% of febrile children (2) do not have an accompanying illness (Borensztajn et al., 2022; Burokienė et al., 2017; Iroh Tam et al., 2016; Karakaş et al., 2020; Öztürk et al., 2015). The complaint of fever in children, which continues to increase every year globally, leads to repeated emergency department visits shortly after discharge, which increases the workload and cost in emergency departments, negatively affects the quality of patient care, and decreases hospital performance. (Akçay & Gül, 2022; Badolo et al., 2022; Borensztajn et al., 2022; Burokienė et al., 2017; Iroh Tam et al., 2016; Swavely et al., 2015; Thompson et al., 2020). Therefore, new strategies are needed to optimize the primary health care system to reduce the social and emergency department burden of the global public health problem caused by fever.

Early recognition of fever in childhood and correct intervention at the appropriate time and with the right method are effective in protecting the child from complications related to fever (Ahmed Khalil et al., 2023; Karakaş et al., 2020; Öztürk et al., 2015; Thompson et al., 2020; Yiğit & Sarıalioğlu, 2022). However, studies conducted worldwide have shown that parents lack knowledge about fever management and care at home and resort to incorrect practices (Akçay & Özgür, 2022; Badolo et al., 2022; Thompson et al., 2020; Thota et al., 2018; Waly & Bakry, 2022; Wijaya et al., 2022; Yiğit & Sarıalioğlu, 2022). Due to incomplete or erroneous information and practices, fever may persist and even increase rather than decrease, causing parents to apply to the emergency room again with the complaint of fever and negatively affecting the development of the child (Akçay & Özgür, 2022; Öztürk et al., 2015; Swavely et al., 2015; Thompson et al., 2020). Therefore, interventions aimed at reducing the medicalization of childhood fever, which is often self-limiting, are crucial to reduce the pressure on the emergency department workload and enhance parental self-management strategies. Studies in the literature focused on a limited number of early intervention strategies for childhood fever such as education, training and simulation, but the effectiveness of these interventions were often inconsistent (Chang et al., 2016; Herman & Nurshal, 2017; Kelly et al., 2019; Toksöz, 2023; Wijaya et al., 2022; Yoffe et al., 2011). For these reasons, research should be conducted to provide evidence of the effectiveness of home visits in monitoring growth and development, which are the main indicators of child health and should never be neglected, and in early diagnosis of childhood diseases.

Home visitation programs are an interventional strategy that evaluate all family members in broad sense in the environment where they live while addressing all related factors and thus enable the creation of healthy communities and the provision of holistic health care in many areas for individuals/families and community groups (Edraki et al., 2015; Kahraman & Havlioğlu, 2023). Although the evidence for home visits has increased significantly in the last two decades, unfortunately, the practice of nurse-led home visits in primary and secondary level health services in Turkey has been almost nonexistent (Durduran et al., 2012; Kahraman & Havlioğlu, 2023).

Therefore, this study aimed to evaluate the effect of nurse-led home visits for children presenting to the emergency department with complaints of fever on their development and repeat emergency visits over 3 months in line with current and

evidence-based research. The results obtained in the present study show that evidence-based home visits have a high impact on public health, especially child health.

Aim of The Study

This study was conducted as a nonrandomized controlled study to determine the effect of monthly nurse-led home visits for 3 months for 3-year-old children who presented to the emergency department with the complaint of fever on the development of children and repeat emergency department.

Research Hypotheses

H_0: There will be no difference in The Ankara Developmental Screening Inventory (ADSI) total and sub-dimension scores and the number of repeat emergency visits between the intervention and the control groups.

H_1: The ADSI total and sub-dimension scores of the children in the Intervention Group (IG) who were monitored by nurse-led home visits for 3 months will be higher than the scores of the children in the Control Group (CG) who did not receive home visits.

H_2: The number of repeat emergency visits will be lower for children in the IG who were monitored by nurse-led home visits compared to children in the CG who did not receive home visits.

METHODS

Type of Research

The study was designed and conducted in accordance with the TREND (Transparent Reporting of Evaluations with Nonrandomized Designs) guidelines developed specifically to guide standardized reporting of experiments and controlled trials (Fuller et al., 2014).

Sampling

The study population consisted of 81 3-year-old children who presented to Şanlıurfa Suruç State Hospital with the complaint of fever between September 6 and October 1, 2022. In order to determine the sample size of the study, power analysis was performed with "G.Power-3.1.9.2" software. Based on a 2017 study using the ADSI (Güneş, 2017), a 7-point increase from 47.48±8.68 to 55±8.68 for the mean ADSI general development T score of 3-year-old children was considered significant, and the minimum sample size was calculated as 54 participants for a two-tailed hypothesis with two independent groups, with 95% power and 0.05 type-1 error. In order to increase the power of the study and to address possible dropouts, the sample size was increased by 15%, and a total of 62 children, 31 in the IG and 31 in the CG, were included in the study. Post-hoc power analysis conducted after the research revealed that the power of the study (1-β) was 1.00 and the sample size was sufficient. Parents of febrile children were informed about the study and parents who agreed to participate in the study were asked to sign an informed consent form. Subsequently, to achieve balance between the study groups and prevent selection bias, the children's names were placed in a bag and each selected name was randomly assigned to the intervention and control groups in an alternating manner. Finally, 31 participants in the intervention group and 31 in the comparison group completed the programmed and entered the analysis (Figure 1).

Inclusion and Exclusion Criteria

Inclusion criteria:

- Child aged 3 years old.
- Presenting to the emergency department with fever
- Not having any chronic disease
- Parents and child speaking Turkish.
- Parents and child not participating in any other program or intervention within the 3-month period.
- Complete follow-up of the child for 3 months

Exclusion criteria:

- Child aged under 3 years old.
- Presenting with a complaint other than fever
- Incomplete follow-up over the 3-month period
- Parents and child not speaking Turkish.
- Participation of parents and child in another program or intervention within the 3-month period
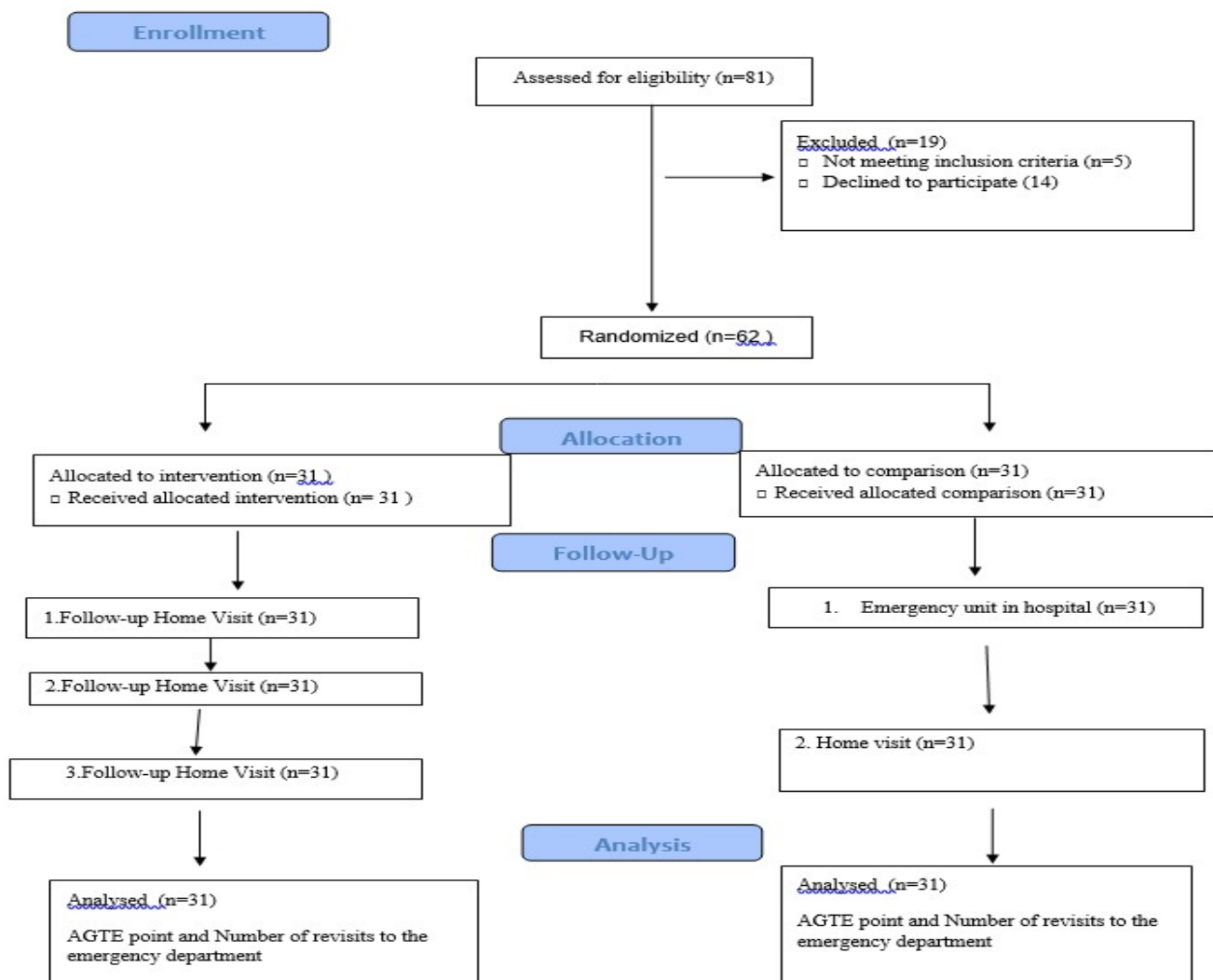
Figure 1. TREND 2010 Flow Diagram

Variables of The Study

Independent variables: Socio-demographic characteristics of the child and mother (age, gender, family income, educational status, etc.). Dependent variables: ADSI scores of the children, the number of repeat emergency room visits with complaints of fever, and follow-up findings obtained from the home follow-up and care form prepared for 3-year-old children.

Data Collection

The research was conducted between September 6 and December 10, 2022 in Suruç district of Şanlıurfa province, which is located in the southeastern part of Turkey and has the highest child population. The study was conducted at the emergency department of Suruç State Hospital and the homes of the individuals in the IG. Of the patients who presented to the emergency department in the last month (August 2022), 34% were admitted to the emergency department with fever, 29% with upper respiratory tract infections (URTI), 11% with gastrointestinal tract (GI), 5% with hypertension, and 21% with other reasons (hypotension, hyperglycemia, hypoglycemia, etc.). Between September 6 and October 1, 2022, 143 children (0-6 years of age) were admitted to the emergency department with the complaint of fever. This constituted 36% of all patients admitted to the emergency department at that time. Of the children presenting with the complaint of fever, 56.0% were 3-year-old children. The average treatment time for febrile children in the emergency department was 30–90 minutes. The routine treatment performed by nurses for febrile children coming to the emergency room was as follows:

•   Blood pressure, pulse rate, respiration were monitored hourly and fever was monitored every 30 minutes.

•   If the child was febrile (rectal fever above 38°C), antipyretic drugs (ibuprofen, paracetamol syrup orally) and cold application were administered.

•   The child was discharged when body temperature returned to normal; if not, antipyretics were administered intravenously (IV). If the fever still remained high, blood and urine tests were performed and a pediatric specialist was consulted by the physician.

•   No training or counseling was given to the discharged child and his/her family by the nurse.

Data Collection Tools

The questionnaire form prepared by the researchers in accordance with the relevant literature (Ahmed Khalil et al., 2023; Akçay & Özgür, 2022; Borensztajn et al., 2022; Burokienė et al., 2017; Iroh Tam et al., 2016; Kahraman & Havlioğlu, 2023; Karakaş et al., 2020; Toksöz, 2023; Waly & Bakry, 2022) consists of 19 (14 multiple-choice and 5 open-ended) questions. Of these questions, 6 were about the socio-demographic characteristics of the family and 5 were about the evaluation at the time of presentation to the emergency department.

Home Follow-up and Care Form for 3-Year-Old Children: This form was developed by the researches by utilizing the child follow-up protocols of the Ministry of Health General Directorate of Public Health in primary health care. The form consists of 7 sections, including measurement findings that assess the child's growth and development, vaccination status, examination findings, developmental status, nutritional status, medication status, and observation results.

ADSI is a 154-item assessment tool developed by Savaşır et al. (1994) that provides in-depth and systematic information about the development of infants and children. Children, starting from 0–3 months and continuing up to 48–72 months, are

individually assessed and observed on a monthly basis for language development, cognitive skills, fine motor development, gross motor development, social development, and self-care skills. The total score obtained from the 154 items of ADSI reflects overall development. Cronbach's Alpha coefficients of the inventory were calculated for children in three different age ranges (0–12 months, 13–44 months, 45–72 months) and it was determined that the internal consistency was quite high for all three age ranges (Cronbach's Alpha coefficients: 0,98- 0,97-0,88). When the test-retest reliability results were analyzed, it was found that the internal consistency for each age range was 0.99, 0.98 and 0.88. In the present study, Cronbach's Alpha coefficient for 13–44 months was 0.95. The ADSI assesses the development and skills of children aged 0–6 years based on information from mothers or fathers or caregivers who closely monitor the child's development and know the child well. Starting with the age-appropriate section, the questions are asked one by one to the mother or the primary caregiver of the child. Each "yes" answer is given a score of 1 while each "no" answer is given a score of 0. If eight questions in a row receive a "no" answer, the interview is ended. There are two types of profiles for interpreting ADSI development scores. The T score profile was used in the present study.

T Score (Total Score) Profile: The T Score is used to show where the child's overall development falls in the normal distribution. After the child's overall development score is calculated, the calculated score is written under the child's age column in the T score table. The T score corresponding to the raw score obtained by the child is found from the table. The average T score is considered to be 50. A score below 50 indicates that the child's mental-motor development is not normal, while a score of 50 and above indicates that the development is normal.

WHO-MGRS (Multicentre Growth Reference Study) Standard/Reference Growth Curves: Since the World Health Organization recommends the use of Z-score (SD) and, when necessary, percentile values for WHO-MGRS 0-5 years growth curves in all countries, Z-score was used in the present study (WHO-MGRS, 2007). The weight of the children was measured using a scale. The scale was periodically calibrated to ensure measurement consistency. The scale was also compared to a standard balance to improve the accuracy of the device.

Implementation of The Research

IG: 1st Home visit: The researchers informed the parents in the IG that they would make a home visit within the first week after discharge and an appointment was made with the parents. The first visits started on October 04, 2022 and were completed on October 15, 2022. Researchers made a maximum of three visits in a day depending on the proximity of the homes visited. The first home visits lasted a minimum of 40 minutes and a maximum of 60 minutes. During home visits, children were examined and monitored in terms of growth and development according to the home follow-up and care form prepared for 3-year-old children. It was questioned whether the complaint of fever persisted after the child was discharged from the emergency department, and necessary care was provided to the child and education was provided to the mother. Parental education mostly focused on what to do to prevent fever, what to do after a fever breaks out, and the use of medicines prescribed in the emergency room. During the home visit, the order and hygiene of the living environment, the mother's behavior and care toward the child were observed. Mothers were provided with training on age-appropriate nutrition, hygiene and self-care, and toilet training, including applicable recommendations to improve mothers' knowledge and behaviors. Planning and scheduling of the next home visit was made.

2nd Home Visit: This visit took place one month after the first visit. The visits started on November 5, 2022 and were completed on November 16, 2022. During home visits, children were examined and monitored in terms of growth and development according to the home follow-up and care form prepared for 3-year-old children and necessary care was

provided. The second home visit lasted a minimum of 50 minutes and a maximum of 90 minutes. Mothers were provided with training on healthy communication with the child, physical activity, and games that will help the child's mental development. Mothers were asked whether they had implemented the training they received during the previous visit, and for those who had forgotten parts of the training, the topics were summarized again. Planning and scheduling of the next home visit was made.

3rd Home Visit: This visit took place one month after the second visit. The visits started on December 5, 2022 and were completed on December 15, 2022. During home visits, children were examined and monitored in terms of growth and development according to the home follow-up and care form prepared for 3-year-old children and necessary care was provided. The third home visit lasted a minimum of 50 minutes and a maximum of 90 minutes. After informing the mothers that this was the last visit of the research, the 3-month period was reviewed and the trainings needed by the mothers were repeated and the necessary care for the child was provided.

CG: First interview: This interview with the CG was conducted in an emergency setting. These interviews started on September 6, 2022 and were completed on October 1, 2022. The interviews were conducted in the nurse's office after the fever had stabilized and one hour before discharge. Parents were informed about the study and informed consent form, questionnaire form and ADSI were filled out. The first interview lasted a minimum of 15 minutes and a maximum of 25 minutes. At the time of discharge, the researchers asked the address of the parents to conduct the follow-up interviews three months later.

Final interview: The final interviews of the CG started on December 4, 2022 and were completed on December 12, 2022. During the visit, ADSI was administered again and any questions the mothers had afterward were answered. However, this group did not follow a predetermined program. The final interviews with the CG lasted a minimum of 25 minutes and a maximum of 40 minutes.

Blinding

In this study, the researcher assistant who collected the data was masked to the study groups and the intervention program. Moreover, the statistician who did the data analysis was blinded to the allocation of the participants in the study groups, as well.

Data Analysis

The data obtained were recorded and evaluated in IBM SPSS Statistics v.22.0 software package. In statistical analyses, mean and standard deviation were used for continuous variables whereas number and percentage were used for nominal variables. The conformity of continuous variables to normal distribution was determined using the Kolmogorov-Smirnov test, normality graphs, and skewness and kurtosis coefficients together. For continuous variables, the significance of the differences between groups was investigated using independent samples t-test, repeated measures t-test, Chi-square test, and Fisher's exact test. For all analyses, p values below 0.05 were considered significant.

Ethical Considerations

Ethical approval was obtained from XXX University Clinical Research Ethics Committee (session number 20 and decision number 21 on 15.11.2021) for the study. Immediately after the ethics committee approval, approval was obtained from the Şanlıurfa Provincial Directorate of Health Scientific Research Studies Applications Review and Evaluation Commission. The

approval was obtained from Şanlıurfa XXX State Hospital where the study was conducted. The study was conducted in accordance with the Declaration of Helsinki and informed consent was obtained from all participants.

RESULTS

According to Table 1, 51.6% of the children admitted to the emergency department with the complaint of fever were female. It was found that 30.6% of the mothers and 58.1% of the fathers of the children had high school education or higher. 35.5% of the children were the third child. Mothers were the primary caregiver of 91.9% of the children. While 82.3% of the mothers were housewives, 43.5% of the fathers were agricultural workers. It was found that 46.8% of the families had an income level at minimum wage. Statistical analysis determined that there was no statistically significant difference between the socio-demographic characteristics of the intervention and control groups and the groups exhibited similar socio-demographic features (p>0.05).

In the initial evaluation, it was found that 51.6% of children who presented to the emergency room with the complaint of fever had fever. 45.5% of the parents stated that their child's fever lasted more than three days. 32.3% of the parents stated that they considered 38ºC and above as high fever. Statistical analysis revealed that there was no statistically significant difference between the fever conditions of the intervention and control groups and that the children in the groups had similar fever characteristics (p>0.05). In addition, the mean weight of the children in the IG was 14.8±1.1 kilograms in the 1st month, 15.03±1.2 kilograms in the 2nd month, and 15.22±1.2 kilograms in the 3rd month (F = 84,272, p<0.001). The mean height of the children was 98.26±3.0 centimeters in the 1st month, 98.58±2.9 centimeters in the 2nd month, and 99.26±3.0 centimeters in the 3rd month (F=82.831, p<0.001).

Table 1. Distribution of Socio-Demographic Characteristics of Children and Parents by Groups

Variable	Lower Level	Intervention n	%	Control n	%	Total n	%	Statistical Significance X^2/ p
Children Gender	Female	16	51.6	16	51.6	32	51.6	X^2=0.000
	Male	15	48.4	15	48.4	30	48.4	p=1.000
Mother Education	Illiterate	4	12.9	4	12.9	8	12.9	X^2*=
	Literate or primary school	8	25.8	9	29.0	17	27.4	p=0.967
	Middle school	10	32.3	8	25.8	18	29.0	
	High School and Above	9	29.0	10	32.3	19	30.6	
Father Education	Literate or primary school	6	19.4	4	12.9	10	16.1	X^2=3.154
	Middle school	5	16.1	11	35.5	16	25.8	p=0.207
	High School and Above	20	64.5	16	51.6	36	58.1	
Which Child	1st child	3	9.7	7	22.6	10	16.1	X^2=3.439
	2st child	8	25.8	9	29.0	17	27.4	p=0.329
	3st child	14	45.2	8	25.8	22	35.5	
	4st child or Above	6	19.4	7	22.6	13	21.0	
Caregiver	Mother	28	90.3	29	93.5	57	91.9	X^2*=
	Others	3	9.7	2	6.5	5	8.1	p=1.000
Father's Profession	Not working	1	3.2	1	3.2	2	3.2	X^2*=
	Officer	4	12.9	6	19.4	10	16.1	p=0.941
	Agricultural worker	14	45.2	13	41.9	27	43.5	
	Self-employment	12	38.7	11	35.5	23	37.1	
Family Income	Below minimum wage	6	19.4	13	41.9	19	30.6	X^2=3.794
	Minimum wage	17	54.8	12	38.7	29	46.8	p=0.150
	Above minimum wage	8	25.8	6	19.4	14	22.6	

n= Number %= Percentage ratio X 2= Chi- Square test p = Significance value * Fisher-Exact Chi- Square test

Table 2. Evaluation of 3-Month Adsi Sub-Dimension Scores and Number of Emergency Room Visits by Groups

Variable	Lower Level	Intervention X±SS	Control X±SS	Total X±SS	Statistical Significance †t *p
Linguistic-Cognitive	1st month	46.58±2.7	46.81±2.0	46.69±2.3	t=-0.368/p=0.714
	3rd month	51.26±2.0	47.23±2.0	49.24±2.8	t=7.665/p<0.001
Fine Motor	1st month	19.48±1.0	19.71±0.6	19.60±0.8	t=-1.014/p=0.315
	3rd month	20.94±0.9	19.77±0.6	20.35±1.0	t=5.383/ p<0.001
Gross Motor	1st month	22.97±0.4	23.16±0.5	23.06±0.4	t=-1.627/p=0.109
	3rd month	23.61±0.4	23.19±0.5	23.40±0.5	t=3.178/**p=0.002**
Social Skills-Self-Care	1st month	33.39±1.0	33.77±1.4	33.58±1.2	t=-1.200/p=0.235
	3rd month	35.94±1.0	34.00±1.2	34.97±1.5	t=6.523/ p<0.001
General Development	1st month	122.42±4.5	123.45±4.0	122.94±4.2	t=-0.949/p=0.346
	3rd month	131.74±4.1	124.19±3.8	127.97±5.5	t=7.381/ p<0.001
Repeat Emergency Visits With Fever	1st month	0.77±0.6	0.55±0.6	0.66±0.6	t=1.375/p=0.174
	3rd month	0.26±0.4	0.65±0.5	0.45±0.5	t=-3.045/**p=0.003**

X=Mean   SS= Standart Sapma   t= İndependence Sample T Testi   p= Significance value

Table 2 shows the distribution of children's ADSI scores and the number of emergency room visits at months 1 and 3 according to the groups. The mean linguistic-cognitive sub-dimension scores of the children in the intervention and control groups were almost the same in the 1st month (46.58±2.7 vs. 46.81±2.0) and 51.26±2.0 in the IG and 47.23±2.0 in the CG in the 3rd month (p<0.05). While the children in the intervention and control groups had nearly the same scores in other ADSI sub-dimensions at the 1st month (p>0.05), at the 3st month, the scores were significantly higher in the IG compared to the CG (p<0.05). Mean overall development scores of the children were calculated as 122.42±4.5 for the IG and 123.45±4.0 for the CG at the 1st month (p>0.05) compared to 131.74±4.1 for the IG and 124.19±3.8 for the CG at the 3st month (p<0.05). When the average number of repeat emergency visits with the complaint of fever was analyzed, it was observed that the average number of repeat emergency visits in the 1st month was 0.77±0.60 admissions per month in the IG compared to 0.55±0.6 admissions in the CG (p>0.05). In contrast, the average number of emergency room visits in the 3rd month was 0.26±0.4 in the IG and 0.65±0.5 in the CG (p<0.05)

Table 3. Distribution of Children's Growth Curves According to WHO-MGRS and Mean ADSI-T Scores According to Groups

Variable		Lower Level	Intervention		Control		Total		Statistical Significance [†] X^2 *p
			n	%	n	%	n	%	
Linguistic-Cognitive	1st month	Normal	23	74.2	25	80.6	48	77.4	X^2=0.092
		Not Normal	8	25.8	6	19.4	14	22.6	p=0.761
	3rd month	Normal	31	100	23	74.2	54	87.1	X^2*=
		Not Normal	0	0	8	25.8	8	12.9	**p=0.005**
Fine Motor	1st month	Normal	20	64.5	24	77.4	44	71	X^2=0.705
		Not Normal	11	35.5	7	22.6	18	29	p=0.401
	3rd month	Normal	29	93.5	18	58.1	47	75.8	X^2=8.794
		Not Normal	2	6.5	13	41.9	15	24.2	**p=0.003**
Gross Motor	1st month	Normal	28	90.3	27	87.1	55	88.7	X^2*=
		Not Normal	3	9.7	4	12.9	7	11.3	p=1.000
	3rd month	Normal	31	100	27	87.1	58	93.5	X^2=4.276
		Not Normal	0	0	4	12.9	4	6.5	**p=0.039**
Social Skills-Self-Care	1st month	Normal	23	74.2	24	77.4	47	75.8	X^2=0.000
		Not Normal	8	25.8	7	22.6	15	24.2	p=1.000
	3rd month	Normal	31	100	26	83.9	57	91.9	X^2=5.439
		Not Normal	0	0	5	16.1	5	8.1	**p=0.020**
General Development	1st month	Normal	19	61.3	19	61.3	38	61.3	X^2=0.000
		Not Normal	12	38.7	12	38.7	24	38.7	p=1.000
	3rd month	Normal	30	96.8	13	41.9	43	69.4	X^2=19.427
		Not Normal	1	3.2	18	58.1	19	30.6	**p=0.000**
Child Weight	1st month	Normal	20	64.5	25	80.6	45	72.6	X^2=1.297
		Not Normal	11	35.5	6	19.4	17	27.4	p=0.255

n= Number %= Percentage ratio X 2= Chi- Square test p = Significance value * Fisher-Exact Chi- Square test

Table 3 shows the developmental status of children according to ADSI sub-dimensions. The percentage of children with normal language-cognitive scores in the 1st month was 74.2% in the IG and 80.6% in the CG (p>0.05). In the 3rd month, however; it was seen that this percentage was 100% in the IG and 74.2% in the CG. The difference between the groups at the 3rd month was statistically significant (p<0.05). When the rate of children with normal fine motor development was analyzed, it was found that 64.5% and 77.4% of the children in the IG and the CG had normal fine motor development in the 1st month (p>0.05), while these rates were 93.5% in the IG and 58.1% in the CG in the 3st month, and this difference was statistically significant (p<0.05). While the rate of children with normal overall development was the same in the IG and the CG in the 1st month (61.3%, p>0.05), these rates were 96.8% in the IG and 41.9% in the CG at the end of 3-month follow-up (p<0.05).

DISCUSSION

The findings obtained in the present study provided valuable information on the impact of nurse-led home visits as an early intervention strategy to reduce both pediatric emergency admissions and repeat emergency visits, and the impact of this strategy on the development of 3-year-old children. In addition, the findings add valuable information to the body of knowledge on the impact of nurses as an important part of the public health system, especially in developing countries.

Children making multiple visits to the emergency room due to fever complaints, the majority of whom are three years old, are frequently observed in the location where this research was conducted, posing a significant issue. When national and international studies evaluating the applications to the pediatric emergency department with the complaint of fever are examined, it is stated that fever-related visits are more frequent in children aged 3 years and younger and both emergency department admissions and repeated visits due to fever are more frequent compared to other complaints, which creates a significant burden in emergency departments (Akçay & Özgür, 2022; Borensztajn et al., 2022; Burokienė et al., 2017;

Karakaş et al., 2020; Thompson et al., 2020). In its 2023 report, the WHO (WHO, 2023) recommends that every child should receive preventive care and policies and practices related to home-based interventions that include, protect, promote and support all family members should be implemented. Therefore, this study aims to provide recommendations for this issue and to find an answer to the question of whether home visits conducted by a nurse are an effective method to protect the health and ensure the growth and development of these children.

Conditions that impair a child's health first of all slow down or impair normal growth and development. For this reason, many health problems that may occur in childhood can become more severe in later years if preventive measures are not taken in time (Durduran et al., 2012; Edraki et al., 2015; Iroh et al., 2016; Swavely et al., 2015; Thompson et al., 2020). In the present study, while the overall development scores of the children were the same at the first month of follow-up (p>0.05), mean overall development scores increased by 9 points in the IG compared to an increase of only 1 point in the CG at the third month of follow-up (p<0.05). The inventory used in the present study also assesses whether children's development is normal. Accordingly, the ratio of children with abnormal development at the first month of follow-up was the same in the intervention and control groups (38.7%, p>0.05). In contrast, at the third month of follow-up, the ratio of children with abnormal development was 3.2% in the IG compared to 58.1% in the CG (p<0.05). To the best of our knowledge, there is no study in the literature we can directly compare the results of the present study. Therefore, this study makes an important contribution to the literature and shows that nurse-led home visits have a positive effect on child growth and development. In another study, it was shown that a home visitation program resulted in better weight gain and development indices in the IG compared to the CG after 6 months, while there was no significant difference between the groups at the 1st, 2nd, and 3rd months of the program. (Edraki et al., 2015). It was also determined that planned education for the growth and development of preterm infants, as well as the support provided in the home environment, were effective in developing infants' problem-solving skills and supporting mothers, but had no effect on infants' physical growth (Balcı & Yıldız, 2017). In the present study, the 3-month home visitation program led to positive changes for children by better addressing the needs and requirements of primary caregivers.

Although it is easy to treat fever in children, unconscious, inappropriate and untimely applications can cause negative consequences (Temel et al., 2016). At the end of the third month, the rate of repeat emergency visits with the complaint of fever was significantly lower in the IG (0.26±0.4) compared to the CG (0.65±0.5) (p<0.05). Studies conducted worldwide and in Turkey have shown that education programs for parents using different methods regarding how to approach and provide care to a febrile child resulted in positive outcomes compared to control groups (Herman & Nurshal, 2017; Kelly et al., 2019; Toksöz, 2023; Wijaya et al., 2022; Yoffe et al., 2011). Two studies on fever were found. In one study conducted in Malawi voluntary counselling through home visits led to a significant reduction in reported infant fever. Another study found that home visits by nurses had no effect on the prevalence of 14-day fever at follow-ups after six and 12 months, but communities exposed to a more intensive home visit intervention, in terms of both the duration and frequency of visits, had significantly lower fever rates after six months than control villages (Ma et al., 2019), This study shows that a three-month follow-up is effective. Another study showed that scenario simulation-based training was superior to fever management guidelines alone in improving parents' fever management knowledge, motivation, behavioral skills, and management behaviors (Chang et al., 2016). One study reported that although 24/7 nurse telemedicine service was provided in the pediatric clinic, parents still made repeat visits to the hospital (Swavely et al., 2015). However, these studies have focused on parental knowledge and attitudes about childhood fever management and the consequences of this situation on the hospital and the child have not been evaluated. Moreover, the knowledge and practices acquired through educational

interventions can diminish over time and result in parents not being able to perform these interventions effectively. A study on emergency department visits also showed that a single education and teaching session alone had a low probability of changing the dependency on emergency department visits for non-emergency complaints (Fieldston et al., 2013). Therefore, additional strategies are needed to reduce reliance on the emergency department in non-emergency situations. These results suggest that nurse-led home visits can reduce fever and are crucial in creating beneficial effects for the healthy development of children and reducing dependency on the emergency department. In this context, nurse-led home visits may be a better approach than simply educating caregivers to expand access to primary health care services and reduce emergency department admissions for non-emergency cases.

Strengths and limitations of the study

One of the strengths of this research is that it was an experimental study with a CG and the research power was high. In addition to these, the fact that home visits were not only based on self-reports but also included observation by the researcher, and collection of reliable data through application methods are other strengths of the study. The main limitation of the study is that the long-term effects of nurse-led home visits could not be analyzed. As for other limitations, firstly, the research was conducted on children selected from a single district, and the socioeconomic and sociocultural status of these children did not represent all children in Turkey. Additionally, the research was conducted with children in a specific age group and having fever complaints, and the results cannot be generalized to the entire population of pediatric patients. Therefore, further studies should be conducted with larger patient groups, different contexts, and populations. Another limitation of the study was that the active components and mediation processes through which the intervention had an impact were not tested and left for further research. Lastly, the evaluation was conducted by the same research team that conducted the initial trial; for future research, independent evaluators should be designated.

CONCLUSIONS

In this study, the effect of nurse-led home visits after discharge from the emergency department for 3-year-old children with fever complaints was investigated. This strategy, designed to address inefficiencies caused by overuse of the emergency department, showed that the nurse-led home visitation program within the context of primary care reduced repeat emergency visits with the complaint of fever and improved the development of children. Further evidence-based applied studies should be conducted on this subject.

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