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Address: Mashhad Nursing and Midwifery School, Ebn-e-Sina St.,
Mashhad, Iran

P.O.Box: 9137913199

Tel.: (098 51) 38591511-294

Fax: (098 51) 38539775

Email: EBCJ@mums.ac.ir





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Pataraporn Yubonpunt¹, Jadsada Kunno¹, Pramon Viwattanakulvanid¹,
Kanchana Rungsihirunrat^{1*}

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Abstract

Background: The role of family caregivers in the promotion of safety for hospitalized children is an important issue in the area of safety improvement. However, there are limited studies related to innovative programs.

Aim: This study aimed to investigate the effects of a multi-component program on family caregiver's knowledge and engagement in promoting safety.

Method: A quasi-experimental study was performed on 160 female family caregivers in two pediatric wards of two public hospitals in Thailand, in 2019. Participants were assigned into two groups of intervention (n=80) and control (n=80) through consecutive sampling. The program was developed based on the standardized guidelines of child patient safety. Participants were educated and trained. The participants' knowledge and engagement were measured using validated questionnaires. An analysis of covariance (ANCOVA), controlling for some possible confounders, was performed to examine the effect of intervention.

Results: Family caregivers gained more knowledge after the implementation of the Multi-Component Program. They noticed if something was wrong and checked the administration of medication by nurses after the intervention. Engagement in promoting safety was enhanced in each domain. Mean±SD scores of three dimensions of Multi-Component Program including advocate to ask, report and response, and dimension monitoring were obtained at 4.61±0.26, 4.48±0.19, and 4.76±0.25, respectively. Moreover, the groups' post-test scores of knowledge and engagement were significantly different (P<0.001) after adjusting the length of stay.

Implications for Practice: The Leaflet, Poster, Talking, Video, and SMS program can enhance a family caregiver's ability to take responsibility for children. The findings indicated the possible range of safety behaviors that family caregivers can perform during the childcare process. Healthcare providers should adopt this program as a part of child safety promotion in hospital settings.

Keywords: Caregivers, Hospitalized children, Patient engagement, Patient safety

1. College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand

* Corresponding author, Email: kanchana.r@chula.ac.th

Introduction

Patient safety is defined as freedom from risk and harm to the patient through the processes of health care (1). Hospitalized children cannot decide about their own care due to their vulnerability to medical errors and harmful situations. The family caregivers take care of patient children and observe their symptoms as their representative. The roles and responsibilities of family caregivers are perceived as "arms and legs" to protect and prevent their own hospitalized children from harm (2, 3).

Parents reported that the child's safety was linked to problems with medication, treatment complications, problems with medical equipment, lack of communication between staff, and poor communication between medical center staff and family members (4). Although it seemed that the rates of adverse events tended to increase, more than half of those adverse events were preventable (5). Therefore, the safety of hospitalized children depends on the parents' communication and behavior to prevent unsafe events (6-7).

A large number of studies have been conducted in the pediatrics unit, most of which were exploratory and qualitative studies (8). Knowledge is an intrapersonal factor that is fundamental for understanding different situations and behaving appropriately. Lack of knowledge makes it difficult to act and engage in safety-related behavior to promote the safety of hospitalized children (9). Some previous studies have offered several ideas to encourage active involvement in the hospitalized child's safety through increasing knowledge about the safety issues (2, 10, 11). However, little is known about the role of family caregivers in promoting the safety of hospitalized children during the care process. Particularly, there is a lack of experimental study on the tactics used to enhance the family caregiver's role in the safety issue (2, 10-12). Therefore, the emphasis in this study was on the family caregivers' knowledge and engagement in promoting the safety of hospitalized children. In coordination with healthcare staff, family caregivers are actively involved in the promotion of children's safety by adopting safety-related behaviors to prevent harm during the child's care process.

In the context of the public hospitals in Thailand, healthcare providers treat and serve many patients in the condition of manpower limitations. Sometimes there were safety incident reports due to the involvement of caregivers in the Thai families in the basic caring of children. These family caregivers cannot be part of a team involved in the safety of children for several reasons, such as fear of making mistakes, fear of complaining about professional staff, and the belief that nurses could do a better job (13-14). The researchers observed ten family caregivers at the pediatric ward in a public hospital and found that most of them misunderstood their roles in the issues related to the safety of children. This study supported family caregivers through the provision of knowledge and engagement in promoting the safety of hospitalized children in order to mitigate the burden of healthcare providers.

To the best of the authors' knowledge, no studies have yet investigated the effect of the multi-component program on promoting family caregivers' knowledge and engagement in the safety of hospitalized children in public hospitals. Therefore, the multi-component program was developed based on an international guideline for laypeople who are family caregivers for hospitalized children in public hospitals. This program consists of such materials as Leaflet, Poster, Talking, Video, and SMS (LPTVS) to inform family caregivers about what they should know and the way they should be involved in promoting the safety of hospitalized children. This study aimed to determine the effect of a multi-component program on the improvement of knowledge and engagement of family caregivers in promoting the safety of hospitalized children in public hospitals.

Methods

In this quasi-experimental study, pre-test and post-test were conducted in both intervention and control groups in pediatric wards of two public hospitals in the North-Eastern of Thailand during August- October 2019. These hospitals were purposively selected based on the main diagnosis of pediatric patients who were assigned to the experimental and control groups. Both hospitals in this study were administered under the Ministry of Public Health in Thailand.

The study population included the family caregivers of hospitalized children with respiratory diseases (i.e., Bronchitis, Pneumonia, Asthma, RSV, croup syndrome) who were admitted to the pediatric wards. The number of pediatric inpatients was estimated to be approximately 1,000 cases annually and 80 cases monthly on average. Participants were selected based on consecutive sampling methods. The inclusion criteria included female caregivers aged 35-60 years old, who were caregivers of hospitalized children aged 3-7 years old in pediatrics wards of respiratory diseases, ability to

participate in the study and give informed consent, writing and reading in Thai languages, and regular use of a mobile phone. However family caregivers of hospitalized children with the following conditions were excluded from the study: 1) those re-admitted in the data collection period, 2) those transferred from an intensive care unit or the inpatient unit of another hospital, 3) those whose vital signs changed, and 4) those admitted into the pediatric ICU. The sample size was determined by comparing two independent means formulas (15). The medium effect size of 0.5, a power of 0.80, and the desired alpha or type I error of 0.05 were utilized to determine the sample size. The minimum sample size for each group in this study was calculated at 64 and 25% was added up to this number, considering the expected rate of attrition. Accordingly, the final sample size for each group was calculated to be 80 and the total sample size was determined at 160 (Figure1). A multi-component program based on an educational approach combining material and technique for the family caregiver during the child's hospital stay was used as the intervention. This program consisted of LPTVS. The content of the intervention was mainly developed based on Speak Up: Prevent Errors in Your Child's Care and 20 Tips to Help Prevent Medical Error in Children (16-17). 'ARM' represents three dimensions of this program are which is an abbreviation for Advocate to Ask, Report and Response, and Monitoring and Making sure. This abbreviation represents the key safety-related behaviors of family caregivers in promoting the safety of hospitalized children. This study concerns the safety related behaviors and includes the following main content: 1) provision of important information about children's medical history, 2) observation and checking of care processes, 3) identification and reporting of treatment complications, and 4) family caregivers' speaking up in case they have any safety-related concerns about the care provided to the child. Eventually, all of these safety related behaviors will affect the status of safety care offered to children.

Furthermore, there are patient safety guidelines to adhere to and practice according to pediatric wards that were accredited following the standard of healthcare quality accreditation (HA) and occupied by the intervention and control groups. Therefore, the pediatric patients and family caregivers in both groups were similarly approached by healthcare professional staff concerning the usual care standard. The data collection process was conducted on both the intervention and the control groups similarly. The researcher consulted an in-charge nurse to recruit participants based on the inclusion criteria. The informed written consent was obtained from all the participants. The research assistant collected baseline data (30 within min, in a face-to-face manner) before the start of the intervention program. The post-test (45 min) was completed on the day before pediatric patients were discharged. The duration of the program for each participant was based on the length of the children's stay in the hospital.

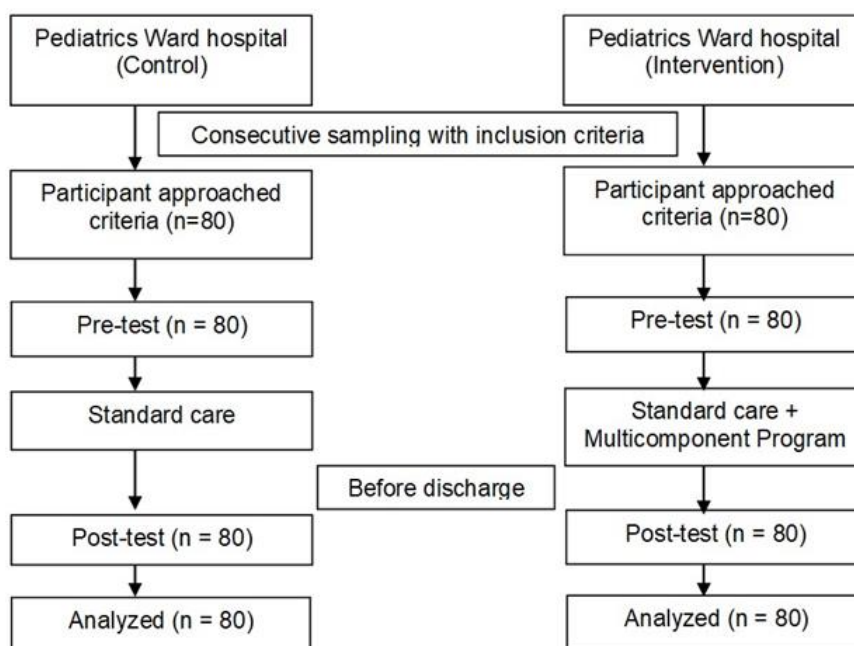


Figure 1. Flowchart of participants

Participants in the intervention group received an additional LPTVS program that was carried out at the child's bedside by the researcher in Thai languages. There were three sessions separated by key tools and techniques of the intervention program including session 1) Distribution of leaflet and poster (15 min). The safety leaflets were used to educate caregivers on how to engage in promoting the child's safety. The safety posters were attached to the bed using scotch tape to remind family caregivers about their roles. Session 2) Safety Talk Training using video (30 min). This educational session was implemented at the child's bedside in a face-to-face manner. The researcher, as a health educator, encouraged and empowered participants to engage in promoting the safety of hospitalized children. Activities in safety talk training consisted of educating via video, sharing, and questioning answering. Each participant received the program only one time during session 1 and session 2. Session 3) SMS alert: participants are reminded to engage in promoting safety for their child care. The researcher sent an alert text by phone on the next day every morning before a clinical round. The parents received alerts until their child was discharged.

The questionnaire was created and developed to assess the main outcomes based on the guidelines and literature reviews. The content validity of the questionnaire was examined by three experts who were experienced in the area of quality and safety management, representatives from the Healthcare Accreditation Organization, and pediatricians or nurse administrators in pediatric wards at the hospital. The internal consistency of the questionnaire was confirmed using the Index of item Objective Congruence (IOC) which was obtained at 0.97. The questionnaires were divided into three sections: 1) Socio-demographic characteristics of the family caregiver and hospitalized children. 2) Knowledge on promoting the safety of hospitalized children. Initially, 25 items were developed based on the literature regarding the active role involved in promoting patient safety regarding the contents of the education program. The knowledge scores were classified into 3 levels. The scores were defined as low, moderate, and high level when they were 0-15 ($\leq 60\%$), 16-20 (61-79%), and 21-25 ($\geq 80\%$). Engagement in promoting safety for hospitalized children. The questionnaires were developed based on safety-related behaviors. Cronbach's alpha score for this questionnaire ranged from 0.65 to 0.86 (18-19). Some items were developed from The Index of Parent Participation/Hospitalized Children Actual Activities with the Cronbach's alpha of 0.91 (20). In addition, the questions were developed to cover details of a child's safety based on child care recommendations in Speak Up: Prevent Errors in Your Child's Care and 20 Tips to Help Prevent Medical Error in Children (16-17). It is worth mentioning that 39 items were categorized into three groups regarding the content of the education program including Advocate to ask, Report and Response, and Monitoring and Making sure. Five-point Likert scales were utilized to assess caregivers' level of agreement on how they act in regard to each item. The scores of engagement in promoting the safety of hospitalized children were separated into three low, moderate, and high levels. The mean 1.00-2.33 was defined as a low level, 2.34 -3.67 as a moderate level, and 3.68-5.00 as a high level (the higher scores indicated higher engagement in promoting the safety of hospitalized children). The reliability of the questionnaire was tested to ensure the internal consistency of measurement tools on 30 family caregivers of hospitalized children in another public hospital with the same characteristics of the population in this study. The reliability of knowledge questions was measure at 0.75, using the Kuder-Richardson 20 (KR-20). The internal consistency of engagement questions was determined at 0.81, using the Cronbach's alpha coefficient.

The study protocol was approved by the Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University, Thailand. Informed consent was obtained from each participant before the start of the study.

Statistical analysis was carried out using SPSS software (version 22.0). Characteristics of family caregivers, hospitalized children, and the scores of two outcomes were presented with descriptive statistics, including frequency, percentages, means, and standard deviations. The normality of distributed data was determined using the Kolmogorov-Smirnov test. The independent sample t-test, chi-square test, and fisher's exact test were used to compare the differences between the two groups. The assumptions in linear pattern and homogeneity of regression slopes were tested as well. Eventually, the analysis of covariance was used to adjust the confounding factor. Statistical significance was considered at $\alpha < 0.05$.

Results

In total, 160 surveys were completed and a response rate of 100% was obtained in both the intervention and control groups. Table 1 presents the socio-demographic characteristics of family caregivers and hospitalized children. No significant differences were observed between the groups of intervention and control in terms of family caregivers' age, educational level, marital status, relationship to child, hospitalization experience, the experience of the unsafe event in hospital, age of the hospitalized child, the severity of child illness (the level of illness perceived by family caregivers), and the number of previous admissions. The only difference between the two groups was in terms of the length of stay, which was more likely to be longer in the intervention group.

The family caregivers' mean±SD score of knowledge in promoting the safety of hospitalized children was obtained at 16.41±3.28 (a moderate level). The score of knowledge was not different between the intervention and the control group at the baseline (P=0.94). However, following the implementation of the program, the result showed that participants in the intervention group had a higher knowledge score, compared to the control group. The improved items in the intervention group included the

Table 1. Baseline comparison of socio-demographic characteristics of participants (n=160)

Variables	Intervention (n=80)	Control (n=80)	P-value
Mean±SD of family caregiver age (years) ^a	42.40 ±7.93	44.63 ±8.57	0.08*
Education			0.50**
Primary school	19 (23.8)	22 (27.5)	
Elementary school	10 (12.5)	14 (17.5)	
Secondary school	12 (15.0)	15 (18.8)	
High school	24 (30.0)	15 (18.8)	
Bachelor	15 (18.8)	14 (17.5)	
Marital status			0.21***
Single	6 (7.5)	12 (15.0)	
Married	71 (88.8)	63 (78.8)	
Separated, divorced, widowed	3 (3.8)	5 (6.3)	
Relationship to child			0.19***
Mother	50 (62.5)	40 (50.0)	
Grandmother	27 (33.8)	33 (41.3)	
Aunt	3 (3.8)	7 (8.8)	
Experience in hospitalization			0.27**
Yes	63 (78.8)	57 (71.3)	
No	17 (21.3)	23 (28.8)	
Experience of unsafe event in hospital			0.07**
Yes	20 (25.0)	11 (13.8)	
No	60 (75.0)	69 (86.3)	
Mean ±SD of hospitalized child age (years) ^a	4.78 ±1.54	5.06 ±1.52	0.25*
Severity of illness			0.91***
Low	4 (5.0)	3 (3.8)	
Middle	57 (71.3)	56 (70.0)	
High	19 (23.8)	21 (26.3)	
Length of stay (day) ^a Mean±SD	3.83 ±1.01	3.50 ±0.79	0.02*
Number of previous admission			0.51**
No admission	19 (23.8)	29 (36.3)	
1 times	18 (22.5)	13 (16.3)	
2 times	23 (28.8)	19 (23.8)	
3 times	12 (15.0)	13 (16.3)	
≥4 times	8 (10.0)	6 (7.5)	
Knowledge scores ^a Mean±SD	16.40 ± 3.38	16.43 ±3.20	0.94*
Engagement scores ^a Mean±SD	3.61 ± 0.34	3.63 ± 0.26	0.62*

Notes: *Independent t-test, **Chi-square, ***Fisher's exact test, Statistically significant at P<0.05., ^a a, representing quantitative variables, including Age of the family caregiver, Age of hospitalized child, Length of stay, Knowledge scores, and Engagement scores.

higher understanding of family caregivers concerning their role in child treatment (95%; n=76), notifying poor care (96.25%; n=77), reminding doctor or nurse about handwashing, and wearing a clean mask (76.25%; n=61), checking administration of medication by the nurses (92.5%; n=74), and asking about laboratory tests (70%; n=56) (Figure 2).

The participants reported that the mean±SD score of engagement in promoting the safety of hospitalized children in the intervention and control groups were at a moderate level (3.62±0.30). There was no difference between the two groups of intervention and the control at baseline with respect to overall engagement in each domain. Eventually, the intervention group gained higher scores for the following items: asking doctor and nurse about the removal of medical equipment (Mean±SD score of 4.56±0.49), asking about the time of the tests and the required preparation (Mean±SD score of 4.21±0.70), asking about the type of food or drink that should be consumed before each test (Mean±SD score of 4.40±0.68), asking about procedures which make the test safer (Mean±SD score of 4.35±0.59), asking about the side effects of the prescribed medicine and how to deal with them (Mean±SD score of 4.53±0.53). The intervention group also gained higher scores in the domain of report and response in such items as informing the doctor or nurse about worrying issues (Mean±SD score of 4.82±0.38), informing the nurse if the IV area is painful, red, or puffy, and responding to questions asked by doctor or nurse on clinical rounds (Mean±SD score of 4.97±0.15), and preventing infection by washing hands before and after touching the child (Mean±SD score 4.80±0.40). Monitoring and ensuring was another improved domain in the intervention group which included such items as checking child's hospital identification bracelet (Mean±SD score of 4.91±0.28), making sure that the doctor and nurse checked the band, and asked the child's name before giving any medicine, test, or treatment (Mean±SD score of 4.87±0.36), making sure that the correct label has been attached on the container of the child's sample (Mean±SD score of 4.80±0.4), following the results of the laboratory test in order to understand the conditions of the patients (Mean ± SD score of 4.41±0.63).

The results showed that there was a statistically significant difference between the groups of intervention and control in terms of knowledge (mean difference=4.33, P<0.001) after adjusting the length of stay as a covariate factor. There were statistically significant differences between the intervention and control groups in terms of the total scores of engagement (mean difference=0.73, P<0.001) and the score of each dimension of engagement in the safety promotion. This indicated that 80.6% of family caregivers in the intervention group were more engaged in promoting the safety of children compared to the control group (Table 2).

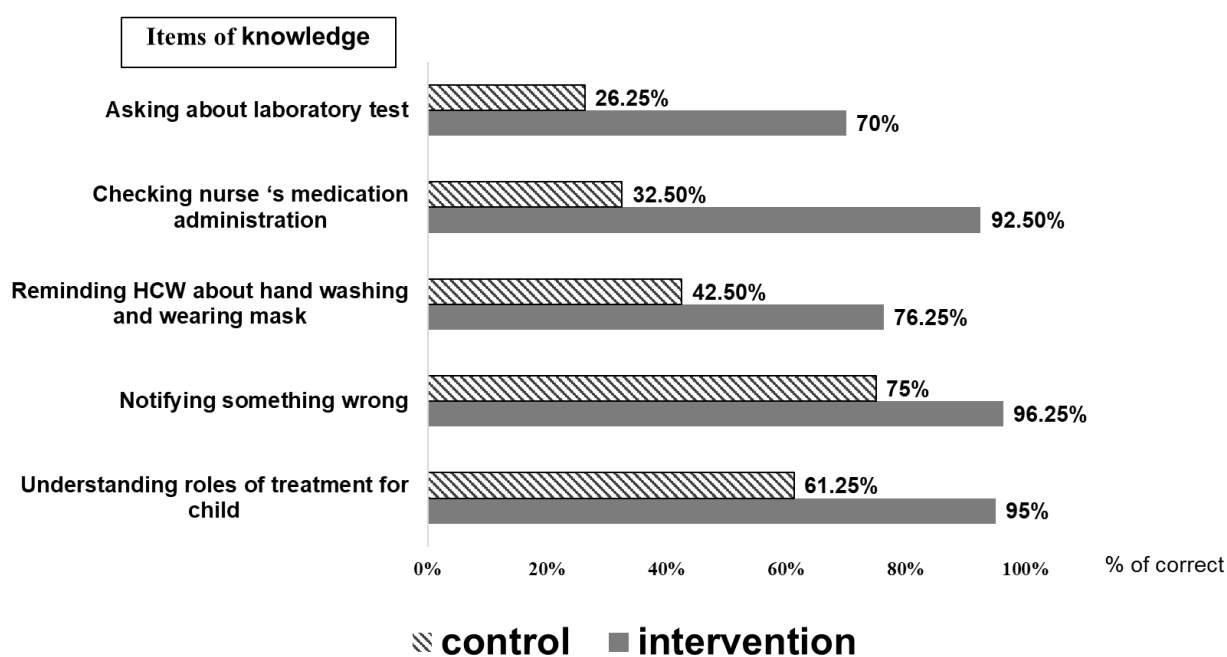


Figure 2. Percentage of correct answers of intervention and control groups

Table 2. Comparison of knowledge and engagement in promoting safety between the intervention and control groups at post-intervention

Outcomes	Intervention (Mean \pm SD)	Control (Mean \pm SD)	F	Mean Difference	P-value [±] (95% CI)	Partial Eta Squared
Knowledge						
Baseline	16.40 \pm 3.38	16.43 \pm 3.20	123.48	4.33	<0.001* (3.57, 5.09)	0.442
Post-intervention	23.81 \pm 0.27	19.43 \pm 3.02				
Engagement						
<i>Advocate to ask</i>						
Baseline	3.58 \pm 0.50	3.61 \pm 0.33	256.96	0.71	<0.001* (0.62, 0.79)	0.622
Post-intervention	4.61 \pm 0.26	3.90 \pm 0.28				
<i>Report and response</i>						
Baseline	3.81 \pm 0.27	3.82 \pm 0.25	349.38	0.61	<0.001* (0.54, 0.67)	0.691
Post-intervention	4.48 \pm 0.19	3.87 \pm 0.21				
<i>Monitoring and make sure</i>						
Baseline	3.45 \pm 0.48	3.47 \pm 0.56	354.80	0.93	<0.001* (0.84, 1.03)	0.695
Post-intervention	4.76 \pm 0.25	3.82 \pm 0.35				
Total Engagement						
Baseline	3.61 \pm 0.34	3.63 \pm 0.26	646.86	0.73	<0.001* (0.68, 0.79)	0.806
Post-intervention	4.61 \pm 0.20	3.87 \pm 0.15				

Note: *Statistically significant at p-value<0.05; [±] Adjusted analysis of covariance for the length of stay, Mean difference=Estimated marginal mean (Intervention – Control)

Discussion

The effect of LPTVS, as the multi-component program was investigated in terms of improving the knowledge and engagement of family caregivers. The results indicated that the family caregivers' knowledge and engagement in promoting children's safety were increased after the LPTVS was implemented in the intervention group.

The knowledge of family caregivers in promoting safety was also improved in the intervention group. Therefore, the present finding showed that the results of each item were improved after the intervention, and family caregivers could inform the doctor and the nurse whether there was anything wrong with the child. Moreover, they reminded doctors and nurses about hand washing or wearing a mask and double-checked the process of medication administration. These items were correctly educated using the LPTVS program. The obtained results were consistent with the results of a scoping review study suggesting that these areas of pediatric health care are highly prone to safety events (21). Similarly, the results of another study indicated that there were significant differences in terms of the score of parents' Speak Up knowledge after the implementation of the patient safety education program (22). The educational approach in this study increased the level of knowledge in family caregivers and these findings were supported by previous studies that well-designed printed and electronic information materials, such as leaflets and posters can improve the level of knowledge in patients and family caregivers (2, 23). In addition, the researcher acted as a health educator for encouraging Safety Talk Training activities, including education via video, sharing, and questioning-answering with a friendly language for laypeople. These can be helpful to family caregivers interested in safety issues and make them more insightful about their role. In the same line, the result of a study conducted by Pinto et al. (2013) indicated that a video was an important educational tool for increasing the knowledge of patients and families about the role they can play during a hospital stay (24). Safety talk is more than just reading a leaflet or a poster, rather it is training that aims to clear out all doubts and lead to more understanding. However, the results of a previous study showed that the need for information was not important for the family caregivers even after their children were staying in the hospital (25).

In this study, all the components of engagement in safety promotion, such as advocating to ask questions, reporting, responding, and monitoring were significantly improved in the intervention group, compared to the control group. This indicated that the LPTVS program can help family caregivers in promoting the safety of children. Therefore, it can be concluded that this intervention program is an educational resource that positively affects the knowledge level of caregivers. The findings of the present study were consistent with those obtained by Schenk et al. (2019) indicating

that the increased knowledge of patients and families about health care processes and the roles of clinicians increased their engagement in the promotion of patients' safety (26). The implementation of a multi-component program can encourage family caregivers to take an active role in getting involved with the promotion of child's safety during hospitalization through increasing their knowledge on safety issues (2). If family caregivers lack knowledge and do not know about the questions they should ask and the roles they should play, they will be reluctant to be involved in the child care process (26-28). Safety leaflets and posters are tools and materials in the LPTVS program that family caregivers can read all the time. They are useful for both the patients and family members to understand their roles in promoting the safety of child patients (2, 19). This result was in line with those obtained by Sahlstrom et al. (2016) that leaflets and posters help patients and families increase their knowledge and understanding about their possible roles which in turn leads to engagement in safety promotion activities (29). In addition, the finding of this study was supported by previous studies which suggested that leaflets and videos can improve attitudes about patient's involvement in safety promotion activities (30-33). The present study aimed to educate family caregivers using Safety Talk Training and to share the lessons learned. This technique can improve and facilitate the engagement of family caregivers in promoting safer care. Based on the results of a systematic review performed by Power and Franck (2008), the provision of instruction and guidance to the parents can affect the quality of care offered to the hospitalized children (34). The obtained results indicated that providing facilities to healthcare providers influenced their engagement in promoting safety. This was consistent with the findings of previous studies that the empowerment of families can lead to their involvement in the child care process (26, 28). In addition, the results of the present study were consistent with those obtained in an integrative literature review that indicated that patients and families can promote their own safety. When parents have a high perception of child safety activities, the need for supervision by staff drops by 80%. Parents' perception of safety issues was associated with the need to monitor the process of care for their children and prevent the occurrence of an error (35). The engagement of family caregivers in the present study was improved mostly by this education program. Similarly, the study performed by Khajeh et al. (2019) showed that educational supportive care programs for mothers can affect infants' pain and cry (36).

However, it was in contrast with the result of another study reporting that a family-centered checklist had no significant effect on the engagement of parents in the perception and promotion of safety (37). There are some reasons for the explanation of this difference. The intervention in the present study consisted of mixed techniques (i.e., both written tools and personnel roles) to improve the engagement of family caregivers. Although the results of previous study showed the improvement of parental involvement using family-centered concept, it still lacked the understanding of patient safety-related behaviors. The results of the present study were inconsistent with those obtained by Latta et al. (2008) reporting that parents liked to participate in the safety promotion activities and be approached by physicians or nurses for their opinion on the care process (39). However, the present study emphasized the role of family caregiver's knowledge in promoting safety. Moreover, some studies investigated the role of simulation-based education and found that these tools improved parental management of fever (40). Moreover, Safety Talk Training, videos, and leaflets have been employed as a simulation in these studies to enhance parent's engagement in promoting the safety of hospitalized children which was in line with the present study. Moreover, it should be noted that SMS alerts were used throughout the programs to remind family caregivers to act their roles and responsibilities towards their own hospitalized children. It was an important tactic that family caregivers can adhere to during the intervention program.

Nevertheless, the study findings indicated that the scores of family caregivers' knowledge and engagement slightly increased in the control group at the endpoint. This result could be explained by several factors. The family caregivers might have previous experiences of taking care of their hospitalized child. Therefore, the caregivers in the control group might have learned some techniques through the real situation experiences. Notably, the previous medical experience can help participants in the control group to know and understand which events require concern and involvement (20, 26, 28, 29). In addition, the organizational factors influence patients' ability to engage (11). In this study, medical policies and physician-nurse practices helped family caregivers learn about their role in safety-related activities for hospitalized children. This issue should be considered in choosing an appropriate design for the next study.

Implications for Practice

The findings showed the effectiveness of the LPTVS program in the enhancement of family caregivers' knowledge and encouraging them to be engaged in promoting safety for hospitalized children. The leaflets and posters with easy to understand language and patterns about children's safety can increase family caregivers' knowledge about their possible roles. Safety Talk Training seemed to be a new method on pediatrics wards. All these activities motivate family caregivers to pay attention to children's safety. Moreover, family caregivers can engage in the promotion of the children's safety through cooperation with healthcare professionals. Provision of education material, such as safety posters and leaflets to hospitalized children can stimulate social knowledge and awareness on caregiver's roles and responsibilities and encourage them to be more attentive to the issue of safety in pediatric wards. These are easy-to-use and inexpensive publication tools that hospitals can supply for caregivers. It is recommended that healthcare providers in a hospital adopt the LPTVS program to support family caregivers in the process of promoting children's safety. It is also suggested that the safety videos be provided and played via hospital television or a QR code channel. Brief safety talk activities can be integrated into the admission process to provide patients and families with more knowledge. In addition to the educational activities, there are also voice alert tools that family caregivers can use to remind healthcare staff to wash their hands in clinical rounds and treatments. This could be considered an innovation for quality improvement projects in the area of pediatric wards.

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Conflicts of Interest

The authors declare that they have no conflict of interest regarding the publication of the present study.

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