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Family-based education and follow-up program for patients with burns: A mixed assessment study

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ABSTRACT

Background: Burn injuries are a major cause of morbidity and mortality worldwide, affecting not only the patients but also their families. Family-based education and follow-up program are interventions that aim to improve the quality of life and psychosocial outcomes of patients with burns and their families. However, we find a lack of evidence on the effectiveness and feasibility of these programs in different settings and populations. This study aimed to evaluate the features of the family-based education and follow-up program (FBEFP), a pilot project that was developed and implemented at the Tabriz Sina Teaching Hospital in 2020 to improve its burn care system.

Design: A mixed-methods approach was used to collect and analyze both quantitative and qualitative data from various sources, such as, questionnaires, medical records, interviews and observation notes, to assess the content, process, and outcome of the program. The study followed the three steps of the CDC's framework for program evaluation: describing the program, measuring its effectiveness, and providing recommendations for improvement.

Results: The results of this study revealed the positive impacts of the FBEFP on the patients' physical, psychological, and social outcomes and quality of life. 4.8% of the people in the follow-up group were re-admitted, while this amount was 7.2% in the group without follow-up. Although the number of readmissions was less in the non-follow-up group, statistically no significant difference was observed between the two ratios before and after follow-up. In order to evaluate satisfaction rates, In the follow-up group, 72 patients and in the non-follow-up group, 38 patients were reached. After converting these data to normal distribution, using t-tests, it was determined that the difference between the two studied groups was highly significant. In other words, the follow-up process had favorable results on satisfaction of the studied people. However, the study also identified some challenges and barriers in implementing the program, such as lack of resources, staff training, and family involvement.

Conclusion: FBEFP is a promising intervention that enhances the well-being of patients with burns and their families. However, more evidence is needed to support its effectiveness

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and feasibility in different contexts and populations. The study also provided valuable insights into the benefits and challenges of implementing a Family-Based Education and Follow-up Program for patients with burns in a low-resource setting. The study contributed to the development of guidelines and recommendations for future research and practice in this field.

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1. Introduction

Burn injury is a complex traumatic event that affects several organ systems and has various local and systemic effects [1]. Burn survivors may face a variety of physical and psychological disabilities that impact all aspects of their lives [2]. Family members of patients with burns also experience strong emotions such as fear, shock, and helplessness after the burn injury, which may be comparable to those of the patients [3].

Discharge from the hospital is a critical and challenging stage in the life of patients with burns. It increases their stress and anxiety and their need for information, education, and reassurance [4]. Discharge planning for patients with burns should involve a structured communication and exchange of information between the multidisciplinary team, including the burn center, the patient and their family, and health care professionals [5]. The aim of discharge planning is to improve patient outcomes, reduce readmissions, and increase patient satisfaction [6–8]. However, studies show that many adverse medical events are related to poor implementation of the discharge planning process [9,10].

Follow up after discharge is one of the elements of care [11,12]. It is also one of the most important ways to help patients with burns prevent further complications [13]. Several studies have been conducted on post-discharge and follow-up programs for different patient populations. These studies have shown that such programs can reduce hospital utilization, improve quality of life, enhance psychological status, and facilitate scar management [14–18]. However, we find many differences in the content and delivery of these programs, and more evaluation is needed to assess their effectiveness for patients with burns.

The Family-based education and follow-up program (FBEFP) for patients with burns has been implemented in Sina Hospital in Tabriz as an innovative discharge plan since two years ago. This program aims to provide nursing care for patients with burns who are discharged from the hospital and involve their families in the process [19]. However, no evaluation of its processes and outcomes has been done so far. Therefore, in order to provide evidence for the modification or continuation of this program in the hospital and to propose a model for other burn centers in the country, we sought conduct a comprehensive evaluation of the quality of this program.

Hence, this study aimed to evaluate the quality of the Family-Based Education and Follow-up Program for patients with burns at Sina Medical Teaching Center in Tabriz.

2. Methods

2.1. Design

This study aimed to evaluate the features of the Family-based education and follow-up program (FBEFP), a pilot project that was developed and implemented at the Tabriz Sina Teaching Hospital in 2020 to improve its burn care system. The program was based on a participatory action research study that involved the faculty of nursing, the hospital managers, and the multidisciplinary burn teams in developing a family-based follow-up care system for patients with burns. It focused on the physical, psychological, and social outcomes and quality of life of patients with burns and their families. The program consisted of educational sessions, phone calls, follow-up appointments, and referrals to specialists according to the patients' needs.

A nurse educator, who had received special training and supervision from a faculty member specialized in burn nursing, delivered the instruction for the program. The nurse educator visited the patients at the hospital within 48 h after discharge, if needed, and then called them weekly for one month and then monthly for two more months. Patients with additional needs visited the hospital monthly for six months. These visits helped monitor their condition, provide feedback and support, answer questions, and address problems. The needs assessment and literature review guided the content and method of the training before the program implementation, which a plastic and reconstructive surgeon approved.

Patients received different training depending on their gender, age, location, burn severity, and underlying diseases. Besides the common topics of irrigation and dressing, wound care, and range of motion exercises, they also learned about their individual and family needs.

The project lasted for two years and the evaluation covered the last six months of service. The evaluation intended to assess the content, process and outcome of the program and to provide recommendations for improvement.

A mixed-methods approach was used to collect and analyze both qualitative and quantitative data from various sources.

The research team applied the CDC's framework to analyze qualitative data, collected from the Family-based education and follow-up program (FBEFP). The Centers for Disease Control and Prevention(CDC), in collaboration with evaluation experts, developed an organizational framework for program evaluation of public health practices [20]. The purposes of the framework are to: summarize the essential

elements of program evaluation, provide a framework for conducting effective program evaluations, clarify steps in program evaluation, review standards for effective program evaluation, and address misconceptions regarding the purposes and methods of program evaluation [21].

Additionally, a comparative descriptive study with a matched case-control design was conducted to evaluate and compare the quantitative data: readmission and satisfaction rates of two groups of patients. Using a convenience sampling method, the researchers recruited two groups of patients without any exclusion criteria. The intervention group ($n = 83$) consisted of patients who consented to the follow-up program and were discharged from the hospital on Sundays and Wednesdays in the last six months of the program. The comparison group ($n = 83$) consisted of patients who received the usual hospital care and were discharged on other days of the week during the same period. The researchers matched the two groups by age, gender, and total body surface area percentage (TBSA%). As shown in Table 2, there was no significant difference between the two groups in these variables. The intervention group received follow-up care, while the comparison group did not.

The data were collected using telemedicine satisfaction questionnaires at three months after discharge. The data were analyzed using descriptive and inferential statistics.

We obtained permission for this study to collect and analyze data from the Committee of Ethics at Tabriz University of Medical Sciences (IR.TBZMED.REC.1401.466).

2.2. Study case

The FBEFP is an initiative that helps patients with burns and their families in Tabriz, Iran. The project uses participatory action research, which means that researchers, practitioners, and participants work together to improve the situation. The FBEFP is a holistic nursing care model that provides education and follow-up care for patients with burns and their families [19]. The program aims to address the medical, psychological, and social needs and goals of patients with burns, who are discharged from the Sina Tabriz Teaching Hospital. The program involves trained nurses who assess the patients, give them information and contacts, arrange family-based follow-up care, offer nursing care and counseling, refer them to other health professionals, and document everything in their files. The program also collaborates with the head nurses in the burn wards and other health care providers, such as burn specialists, nutrition counsellors, and physiotherapists (Fig. 1).

2.3. Applying the CDC's framework for program evaluation

We included six main steps to the CDC's framework which consists of: 1) engage stakeholders; 2) describe the program; 3) focus the evaluation design; 4) gather credible evidence; 5) justify conclusions; and 6) ensure use and share lessons learned. The first three steps of the framework were conducted for this evaluation and are described as they were applied to assessment the FBEFP [22].

2.4. Step one: engage stakeholders

The first step in the CDC Framework approach to program evaluation is to engage the stakeholders. Stakeholders are people or organizations that are invested in the program, are interested in the results of the evaluation, and/or have a stake in what will be done with the results of the evaluation. These may include People affected by your program, People involved in implementing the program or conducting the evaluation, People who will use the results of the evaluation which may include internal staff, partners, program participants, community members, and other organizations, among others [23].

In this program we identified health care providers who had been involved in the delivery of the Family-Based Education and Follow-up Program as main stakeholders. These include implementers of the project, education and follow-up attendant, head nurses of women and men burn ward and educational supervisors.

2.5. Step two: describe the program

In this step, we described the program's mission and goals based on the elements of need, expected effects, activities, resources, and stage of development. We also created a graphical model that summarized the program's inputs, activities, outputs, outcomes, and impacts [22]. Fig. 2 shows the logic model of the program.

The program expects to improve the physical and psychological outcomes of patients with burns, increase the satisfaction and empowerment of family members, and reduce the burden and cost for the health care system. The program uses the criteria of accessibility, acceptability, feasibility, sustainability, and evidence-based evaluation to measure its success [24].

The program arranges family-based follow-up care according to a chart that specifies the frequency and type of follow-up visits for each patient. The follow-up visits can be done at the clinic or by phone. The program assigns a trained nurse to each patient who provides nursing care and counseling during the follow-up visits.

The nurse can also refer the patient to other health professionals if needed. The program documents everything in the patient's file and uses it to track the patient's progress, evaluate the program's effectiveness, and improve the program's quality [19].

The program involved a team of researchers from the Faculty of Nursing, Sina Hospital's managers, and multi-disciplinary burn teams. The program used a questionnaire to assess the patient's needs and goals, and a pen and paper system to recall phone calls for arranging follow-up visits and providing counseling. The program also provided the patient and their family with educational materials, such as a pamphlet and a booklet that covered topics such as wound care, infection prevention, pain management, nutrition, exercise, scar prevention, coping strategies, stress management, and social support. The program received funding from Tabriz University of Medical Sciences to cover the costs of data collection tools, educational materials, follow-up

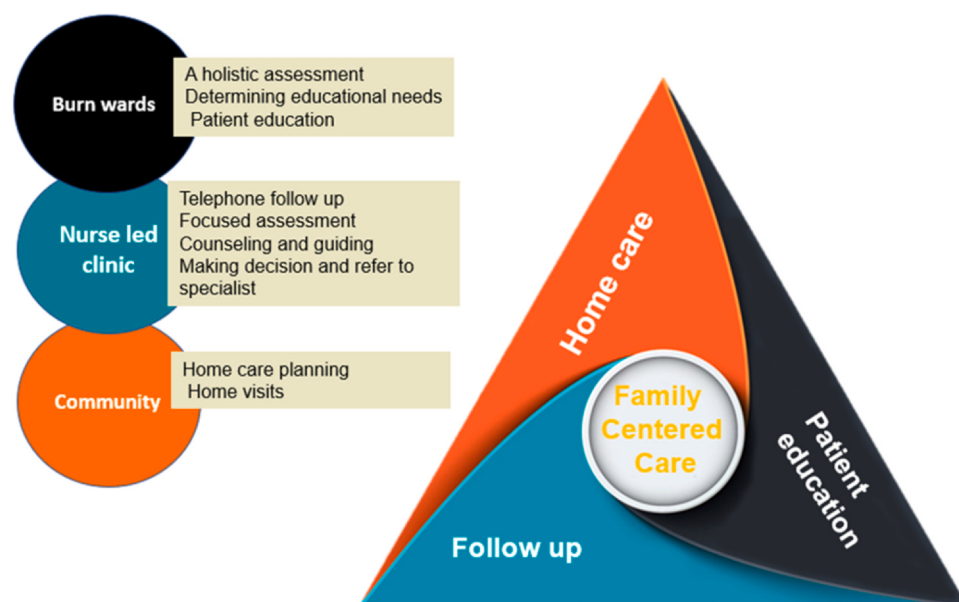


Fig. 1 – The FBEFP: A Holistic Nursing Care Model.



Fig. 2 – Logic model of family-based education and follow-up program for burn patients at Sina Teaching Hospital in Tabriz.

visits, nursing care and counseling services, referrals to other health professionals, and documentation [19].

The program is based on the principles of participatory action research, which involves collaboration and partnership between researchers, practitioners, and participants. The program aimed to improve the quality of life, psychological and social adjustment, and performance of patients with burns and their families [25].

This program also uses the BSHS-B tool [26] to measure the quality of life in various physical, mental, and social domains at the time of discharge, along with the nursing diagnoses, to determine the educational needs and to achieve the expected goals. The FBEFP program addresses different aspects of quality of life in each month of the follow-up program. In the first month, it addresses the physical factors, such as pain, itch, wound healing, and infection prevention. In the second month, it addresses the psychological factors, such as anxiety, depression, post-traumatic stress, and body image. In the third month, it addresses the social factors, such as social support, social comfort, and social participation.

The program has not yet reported its effects or outcomes on the patients with burns and their families. Therefore, the program is still in the process of evaluating its effectiveness and quality. The program may need further refinement and improvement based on the feedback and data collected from the participants.

The program was conducted in Tabriz, Iran during the recent COVID-19 pandemic. The pandemic may have increased the potential disease-related threats for patients with burns and their families. The pandemic may have also affected the access to health services for patients with burns and their families.

2.6. Step three. Focus the evaluation design

In this step, we determined the most important evaluation questions and the appropriate design for the evaluation, based on stakeholder concerns and the CDC framework [27]. We examined four main elements in the evaluation plan: 1) The appropriateness of the educational content and follow-up based on the needs of patients and their families; 2) The

process of implementing patient follow-ups and the ease of program implementation; 3) The outcomes that this program could have in improving patient outcomes; and 4) The experiences of nurses and facilitators regarding the strengths and weaknesses of the program. Table 1 provides a sample list of questions developed by project staff.

We followed the CDC framework to collect and analyze the data. For phase 3, we used multiple sources of quantitative and qualitative data, such as medical records, questionnaires, observation notes, readmission rates, and participants' experiences. We collected the data at different intervals based on their type and purpose. We stored the follow-up process data in the patient's file and analyzed it after three months. We collected the quality of life data at discharge and weekly for the first month, then monthly for the next two months. We also collected the satisfaction and readmission rates after three months. We conducted 12 semi-structured interviews with the nurses and facilitators who implemented the program one month after its completion. We trained the nursing staff and facilitators in a one-day workshop that covered the principles and practices of burn wound care, the psychosocial needs of burn patients and their families, and the skills and techniques for telephone follow-up. We also provided a manual that outlined the program objectives, procedures, and evaluation criteria, as well as the guidelines and scripts for the telephone sessions, which complemented the face-to-face education. We supervised, monitored, feed backed, and supported the nursing staff and facilitators throughout the program to ensure its quality and effectiveness. We referred some patients to other health professionals based on several criteria, such as the severity and complexity of the burn injuries, the presence of any comorbidities or complications, the need for specialized care or interventions, the availability and accessibility of the required services, and the preferences and consent of the patients and their families. For example, we referred a patient with a 30% fire burn and weight loss to a nutritionist, and a patient with 45% burns in the upper limbs and elbow impairment to a physiotherapist. We also made referrals to plastic surgeons and clinical psychologists for some patients.

2.7. Data collection and procedures

We used two questionnaires to collect information to answer the evaluation questions:

2.7.1. Quality assessment checklist for family-based education and follow-up program

We developed a checklist based on the health status assessment form in the Coming Back into Existence Caring Mode [28]. The checklist comprised three sections: demographic profile, physical, mental, social, and spiritual health status, and follow-up program content and process. We used the checklist to review each patient's follow-up care record from discharge to the last follow-up visit and the program documents.

We validated the checklist in terms of content, inter-rater, and construct validity. For content validity, we invited 10 experts in burn care and discharge planning to review and rate the checklist items. For inter-rater reliability, we

Table 1 – Selected evaluation questions for step 3 of the CDC's framework.

Questions
1. How is the characteristics of the family based education and follow up program which includes number of patients under follow-up, educational needs, provided education and quality of life at discharge, after discharge (first week, second week, third week, fourth week and second month) and according to the patient's needs?
2. What is the number of readmission cases for burn patients in two groups under follow-up and without follow-up after discharge?
3. How is the satisfaction of burn patients with the follow-up program in two groups with follow-up and without follow-up?
4. What experiences do nurses and program managers have about the program's strengths and weaknesses?

assigned two independent raters to use the checklist to review 15 cases. We computed the correlation coefficient (r) between the two raters' scores. For construct validity, we measured the internal consistency of the checklist items using Cronbach's alpha. The results showed a high inter-rater reliability ($r = 0.75$) and a good internal consistency ($\alpha = 0.76$) for the checklist.

A research team member who was not involved in assessing, training, or following up the patients in this program completed the checklist.

2.7.2. Telephone follow-up satisfaction questionnaire

We adapted the short version of the Telemedicine satisfaction questionnaire [29], which Yip et al. [30] originally developed. The questionnaire consisted of 11 items with a five-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). The total score varied from 11 to 55, with higher scores reflecting higher satisfaction. We conducted the questionnaire through phone calls with patients. We assessed the test-retest reliability of the questionnaire by administering it to 10 discharged patients two weeks apart. The correlation coefficient between the two tests was $r = 0.80$.

We also measured the quality of life of burn patients using the Persian version of the Burn Specific Health Scale-Brief Questionnaire (BSHS-B) [31]. The BSHSB consists of 40 items in six domains: heat sensitivity, body image, hand function, treatment regimens, work and interpersonal relationships, and affect. Each item is rated on a 5-point Likert scale from 1 (no problem) to 5 (very severe problem). The total score reflects the overall quality of life of the patients. We tested the reliability of the questionnaire by administering it to 15 patients twice with a two-week interval. The correlation coefficient (r) between the two tests was 0.85, indicating a high reliability.

We evaluated the content validity of both instruments by a panel of 12 experts in burn care and discharge planning from Tabriz University of Medical Sciences. We asked the experts to rate all the items of the survey using a four-point Likert scale. We computed the content validity index (CVI) from the proportion of panel member ratings of 3 or 4 on the Likert scale. The CVI was 0.8 for both instruments [32].

We obtained the readmission rates of patients by reviewing their files through the hospital information system (HIS).

2.8. Statistical analysis

We analyzed the data using descriptive statistics (frequency and percent, mean and standard deviation) and inferential statistics (independent t test, Z test and Shapiro-Wilk test) using SPSS 22 software at a significance level $\alpha = 0.05$.

To explore the experiences, perceptions, and opinions of nurses and program managers regarding the strengths and weaknesses of the Program, we conducted semi-structured interviews with them [33]. We used an interview guide that consisted of open-ended questions and probes, covering topics such as the content, process, and outcomes of the program, the barriers and facilitators to the implementation, and the suggestions for improvement. The interview guide was

based on the literature review and the research objectives. We pilot-tested the interview guide with two nurses and one program manager and revised it accordingly. Two researchers who had expertise in qualitative research and nursing education carried out the interviews, which lasted about 30 min and were audio-recorded and transcribed verbatim. They attended a two-hour workshop on semi-structured interview techniques, which the principal investigator facilitated, and practiced with mock interviews. The principal investigator and the research assistant supervised and guided the interviewers regularly. The interviewers used the same interview guide, recording device, and transcription software to ensure the quality and consistency of the interviews.

3. Results

3.1. The quantitative findings are reported as follows

1. To assess the characteristics of the program, we compared the demographic and medical profiles of 83 patients who received follow-up care and 83 patients who did not receive follow-up care after discharge from Tabriz Sina hospital between February 2020 and July 2020. The two groups were matched based on age, gender, and burn percentage. Table 2 shows that there was no significant difference between the two groups in terms of these variables. Table 3 shows that most of the patients in both groups had burns ranging from 1% to 24%, with flame as the most common etiology. The wound healing method was mostly epithelialization or skin grafting, and scar

Table 2 – Demographic comparison of the two groups: followed-up and non-followed-up.

Variable	Group	N (%)	
		Follow up	Non follow up
Gender	Male	54(65)	54(65)
	Female	29(35)	29(35)
Age	10-29	32(39)	24(29)
	30-49	30(36)	37(45)
	50-69	15(18)	21(25)
	70-89	6(7)	1(1)
Education	Under diploma	40(48)	40(48)
	Diploma	30(36)	28(34)
	Bachelor's degree	13(16)	15(18)
Employment Status	Employed	10(12)	8(9)
	Freelance	43(52)	43(52)
	homemaker	18(21)	22(27)
	Student	12(15)	10(12)
Hospital entering	On foot	50(60)	38(46)
	Wheelchair	16(19)	31(37)
	Stretcher	17(21)	14(17)
Duration of Hospitalization	1-19	60(72)	34(41)
	20-39	18(22)	34(41)
	40-59	2(2)	13(16)
	60-79	3(4)	2(2)

Table 3 – Medical characteristics comparison of the two groups: followed-up and non-followed-up at the time of discharge.

Medical characteristics	Group	Frequency (%)	
		Follow up	Non follow up
Total body surface area (TBSA%)	1-24	69(83)	60(72)
	25-49	12(15)	20(24)
	50-75	2(2)	3(4)
Dominant burn depth	I, II	12(15)	10(12)
	II, III	68(81)	73(88)
	IV	3(4)	0(0)
The cause of the burn	Hot fluid	28(34)	21(25)
	Contact	1(1)	8(10)
	Flame	44(53)	45(54)
	Electricity	4(5)	5(6)
	Chemicals	6(7)	4(5)
Wound healing methods	Epithelization	63(76)	38(46)
	Graft	18(22)	45(54)
	Granulation	1(1)	0(0)
	Amputation	1(1)	0(0)
Complications	Scar	8(10)	6(7)
	Edema	70(84)	77(93)
	Blister	5(6)	0(0)
Past medical history	Yes	20(24)	16(19)
	No	63(76)	67(81)
Past drug history	Yes	15(18)	15(18)
	No	68(82)	68(82)
History of ICU hospitalization	Yes	0(0)	1(1)
	No	83(100)	82(99)

Table 4 – Frequency and percentage of follow-up cases based on the educational needs assessment within three months after discharge.

Followed up	Frequency (%)
First week	5(13)
Second week	7(18.5)
Third week	7(18.5)
Forth week	7(18.5)
Second month	10(26.3)
Third month	2(5.2)
Total	38(45.7)
Not respond	21(25)

formation was the most prevalent complication at discharge.

We investigated the follow-up process after discharge for these patients, who received face-to-face training at discharge. We found that only 45.7% (38) of them received follow-up calls, mostly in the second month after discharge 26.3% (10). However, 25% (21) of them did not respond to the follow-up calls (Table 4).

One of the challenges we faced in this study was the low follow-up rate of 45.7%. This was mainly due to the difficulty of reaching the patients/families by phone. Some of the factors that contributed to this difficulty were: patients/families not answering or returning the calls, changing their phone numbers or having disconnected lines, communication

Table 5 – The frequency and percentage of educational needs determined at discharge and for the follow-up group based on the educational needs assessment.

Educational needs	Frequency (%)	
	Patients with needs	Educated items
At discharge	39(47)	106
Post discharge follow up	38(45.7)	40

difficulties, or declining to participate in the follow-up program. To overcome these challenges, we tried to use text messages, and we also asked the patients/families to provide alternative phone numbers or contact persons.

Despite these efforts, we were not able to reach all the patients/families who were eligible for the follow-up program.

We also determined the educational needs of these patients at discharge and during follow-up, which were taught in 106 items at discharge and 40 items during follow-up. Table 5 shows a significant decrease in the educational needs of these patients after follow-up.

We measured the quality of life of these patients using the Burn Specific Health Scale-Brief (BSHS-B) scale, which was recorded during follow-up. Table 6 shows that their quality of life improved over time.

To evaluate the outcomes of the program, we compared the readmission rates and patient satisfaction between the two groups. Table 7 shows that the readmission rate of the follow-up group was 4.8%, while that of the non-follow-up group was 7.2%. However, this difference was not statistically significant ($p = 0.5141$). Table 8 shows that the follow-up group had a higher level of satisfaction than the non-follow-up group, and this difference was statistically significant ($p < 0.001$). Therefore, we can infer that the telephone follow-up had a positive impact on the satisfaction of the patients.

According to the answers given to the questions, the most satisfaction in the follow-up group was related to the ease of talking with the caregiver and overall satisfaction with telephone follow up, and in the non-follow-up group, it was related to the ease of using telephone follow up and talking to caregiver (Table 9).

3.2. The qualitative findings are reported as follows

From the thematic analysis of the interview we derived the following themes [34]. The interviews revealed several advantages and disadvantages of the program, as shown below:

Table 6 – Quality of life of follow up patients.

Quality of life	Number of cases	Mean
At discharge	82	99.98
First month	76	110.52
Second month	0	0
Third month	50	130

Table 7 – Comparison of the readmission rates of the follow-up and non-follow-up groups using the Z test.

Readmission	N (%)	Z	P	CI (95%)	
				UL	LL
Follow up	4(4.8%)	-0.65	0.5141	0.0482007	0.0963935
Non follow up	6(7.2%)				

3.3. Advantages

- The program improved the quality of care and patient outcomes by providing timely and tailored education and follow-up.
- The program increased patient satisfaction and trust by establishing a rapport and communication with the care-giver.
- The program reduced patient anxiety and stress by addressing their concerns and providing emotional support.
- The program enhanced patient self-care and adherence by empowering them with knowledge and skills.
- The program facilitated patient transition and continuity of care by coordinating with other health care providers and services.

3.4. Disadvantages

- The program faced challenges in implementing patient follow-ups due to lack of resources, staff training, and family involvement.
- The program had difficulties in documenting and evaluating patient data due to lack of standardized tools and protocols.
- The program encountered barriers in communicating with patients due to language differences, cultural differences, and low literacy levels.
- The program had limitations in providing face-to-face training due to infection control measures, social distancing, and travel restrictions.
- The program had variations in quality and consistency due to individual differences among nurses and facilitators.

3.5. Lessons learned

The results of this study revealed that the program had positive impacts on the patients' physical, psychological, and social outcomes and quality of life. It also reduced patients' educational needs after discharge. These results were consistent with a pilot study that showed an increase in the quality of life score in the follow-up group [19]. The program reduced the readmission rates and improved the patient

satisfaction. However, the difference in readmission rates between the two groups was not statistically significant. None of the patients in the FBEFP group died during the follow-up period. More detailed studies are needed to confirm this finding. Previous studies have shown mixed results on the effects of post-discharge telephone follow-up on readmission rates [35–37]. We used readmission as an indicator of quality of care and continuity of care in our health care evaluation. However, we recognized that readmission rates alone do not reflect the quality of care, as they depend on many factors unrelated to family perceptions, such as patient characteristics, comorbidities, complications, and service availability [38]. Therefore, we also measured other outcomes, such as satisfaction and quality of life, which are more pertinent and responsive to the impacts of our program.

Patient satisfaction was another indicator of quality of care that was improved by the program. This was supported by other studies that showed the effective role of post-discharge follow-up and education in increasing patient satisfaction [37,39,40]. Patients who are more satisfied with their care are more likely to follow prescribed medical orders, and thereby contribute to a positive impact on their health [41–43].

The facilitators of the program shared their experiences and perceptions of the program, and suggested that sufficient budget and staff be provided to improve the implementation process and generalize it to other hospital departments and hospitals. Some of the participants reported that the patients favored the telephone follow-up method over the face-to-face training, as they perceived it as more convenient and comfortable. However, the majority of the participants agreed that they encountered difficulties in delivering counseling, training, and follow-up over the phone. Some of these difficulties were: patients/families not responding or returning the calls, changing their phone numbers or having disconnected lines, having communication barriers, or refusing to participate in the follow-up program. They also indicated that they attempted to overcome these difficulties by sending short text messages and contacting the patient's family, but they achieved limited success. These difficulties are in line with the literature on the challenges of telephone follow-up in health care [44]. Therefore, we recognize that the low

Table 8 – Comparison of the satisfaction scores of the follow-up and non-follow-up groups using the Z-test.

Satisfaction	n	$\bar{x} \pm SD$	T	P	CI (95%)	
					UL	LL
Follow up	72	41.22 $\pm$ 6.589	-7.014	< 0.0001	-4.236	-7.583
Non follow up	38	47.13 $\pm$ 2.016				

Table 9 – Responses to follow up satisfaction questionnaire.

Questions	Groups	Strongly Agree N	Agree N	Undecided N	Disagree N	Strongly Disagree N
1. I could easily talk to healthcare provider during the telephone follow-up	Follow up	19	41	10	2	0
	Non follow up	9	29	0	0	0
2. I could hear my healthcare provider clearly during the telephone follow-up	Follow up	14	47	9	2	0
	Non follow up	9	29	0	0	0
3. My healthcare provider who called for the telephone follow-up was able to understand healthcare condition	Follow up	10	41	17	4	0
	Non follow up	25	10	3	0	0
4. I was comfortable communicating with healthcare provider during the telephone follow-up	Follow up	10	42	18	2	0
	Non follow up	7	29	2	0	0
5. Telephone follow-up saved me time because I did not have to travel	Follow up	12	19	25	15	1
	Non follow up	18	20	0	0	0
6. I obtained better access to healthcare follow-up services by use of telephone follow-up when compared to face-to-face follow-up	Follow up	14	18	20	20	0
	Non follow up	15	23	0	0	0
7. I did receive enough attention during telephone follow-up session	Follow up	8	35	22	6	1
	Non follow up	7	24	7	0	0
8. Telephone follow-up provided for my healthcare need	Follow up	13	38	18	3	0
	Non follow up	24	12	2	0	0
9. I found telephone follow-up an acceptable way to receive follow-up care	Follow up	8	45	16	2	1
	Non follow up	9	28	1	0	0
10. I will use telephone follow-up services again	Follow up	9	40	21	2	0
	Non follow up	9	28	1	0	0
11. Overall, I am satisfied with the quality of services being provided by the telephone follow-up	Follow up	12	42	16	2	0
	Non follow up	7	30	1	0	0

follow-up rate may compromise the validity and generalizability of our findings.

The study concluded that the Family-Based Education and Follow-up Program was a promising intervention that could enhance the well-being of patients with burns and their families. However, more evidence was needed to support its effectiveness and feasibility in different contexts and populations. The study provided valuable insights into the benefits and challenges of implementing a Family-Based Education and Follow-up Program for patients with burns in a low-resource setting. The study contributed to the development of guidelines and recommendations for future research and practice in this field.

Our study had several limitations that should be considered. We used a quasi-experimental design with a convenience sample from one hospital, which may limit the generalizability of our findings. We did not measure the family outcomes, which may limit our understanding of the program impact. We followed up the patients for only three months, which may not capture the long-term effects of the program. We did not compare our program with other interventions, which makes it hard to determine the relative effectiveness and acceptability of our program. We acknowledge that the two groups differed in the hospitalization and the surgical interventions, which may affect the outcomes. We matched the two groups only based on age, gender, and percentage of burns, and reported the other differences. Future studies should address these limitations by using a randomized trial with a larger and more representative sample, including family outcomes, extending the follow-up, comparing our program with other interventions, and using qualitative or mixed methods to elicit the stakeholder perspectives and identify the barriers and facilitators of the program.

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CRedit authorship contribution statement

ML and HA designed the study, gathered the data, and drafted the article. AA analyzed and interpreted the data. FA edited the paper and had a major contribution in writing the manuscript.

Declaration of Competing Interest

The authors declare that they have no competing interests.

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