Family Nursing Care with Asthma Education Using The Calgary Family Assessment Model (CFAM) and The Calgary Family Intervention Model (CFIM): Case Report

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Abstract

Asthma is a chronic respiratory disease that can be triggered by hereditary and environmental factors, such as exposure to cigarette smoke at home. Effective asthma management requires active family involvement in the care process. This study aims to identify nursing problems and provide interventions for families with a history of asthma using the Calgary Family Assessment Model (CFAM) approach, which consists of the dimensions of Structural Assessment, Developmental Assessment, and Functional Assessment. Meanwhile, the Calgary Family Intervention Model (CFIM) focuses on three main domains of Cognitive, Affective, and Behavioral change as a conceptual framework. The research method used is descriptive with a case study design and the subjects in this study were one family with hereditary asthma selected using purposive sampling. This study was conducted from December 31, 2024, to January 22, 2025. The assessment was conducted for 15-30 minutes using the CFAM approach, which includes structural, developmental, and functional components of the family. The intervention was conducted using the CFAM approach across three domains: cognitive (education), affective (emotional counseling), and behavioral (lifestyle modification). The intervention involved education using easy-to-understand language and illustrated leaflets. Evaluation results showed increased family knowledge about asthma and the dangers of smoking, improved communication among family members, and a decrease in smoking frequency from six to three cigarettes per day. These findings suggest that implementing the CFAM and CFIM concepts can improve family health knowledge and support healthier behavior changes. This study recommends broader use of the CFAM and CFIM concepts in community-based family nursing practice.

Keywords: Asthma, Calgary, Calgary Family Assessment Model, Calgary Family Intervention Model, Family Nursing

Introduction

Asthma is a chronic respiratory disease characterized by airway inflammation and obstruction, resulting in symptoms such as shortness of breath, coughing, and wheezing. According to the Indonesian Ministry of Health (2021), approximately 4.5% of the Indonesian population suffers from asthma. The etiology of asthma is multifactorial, involving genetic predisposition and environmental factors. One of the most common environmental triggers is exposure to cigarette smoke within the household, either through active or passive smoking. Scientific evidence indicates that exposure to cigarette smoke exacerbates asthma symptoms, increases the frequency of attacks, and negatively affects patients' quality of life (GINA, 2023). Susanti et al. (2024) reported that smoking significantly contributes to morbidity and mortality among individuals with asthma, as cigarette smoke acts as a potent trigger for asthma exacerbations. This situation presents a major challenge for families in creating a home environment that supports disease control and prevents recurrence.

The management of asthma therefore requires not only pharmacological and medical treatment but also comprehensive nursing care that actively involves the family. In community health nursing, the family is regarded as the primary unit of care, playing a central role in health decision-making, daily care practices, and patient adaptation to chronic illness. Nurses are expected to facilitate family understanding of the disease, promote supportive caregiving behaviors, and strengthen family functioning and emotional support systems (Ismail et al., 2019).

One theoretical framework widely used in family nursing is the Calgary Family Assessment Model (CFAM) and the Calgary Family Intervention Model (CFIM), developed by Wright and Leahey in the 1980s. CFAM is specifically used as a family assessment framework, enabling nurses to systematically assess families across three main domains: structural, developmental, and functional aspects. Structural assessment explores internal and external family composition, developmental assessment focuses on the family life cycle and associated tasks, and functional assessment examines instrumental and expressive functioning within the family. Through CFAM, nurses can comprehensively identify family strengths, problems, and resources relevant to health conditions.

In contrast, CFIM serves as a guideline for nursing interventions based on the results of the family assessment. CFIM emphasizes strength-based and collaborative interventions aimed at facilitating change in three domains: cognitive, affective, and behavioral functioning of the family. Interventions guided by CFIM are designed to enhance family coping, improve health-related decision-making, and empower families to support patients more effectively (Wright et al., 2019). The integration of CFAM and CFIM allows nurses to move logically from assessment to intervention while actively involving family members in the care process.

The effectiveness of CFIM in family empowerment has been demonstrated in several studies. Nurbadriyah (2019) showed that CFIM-based interventions significantly increased maternal knowledge regarding anemia prevention in preschool children, with a p-value of 0.004. Similarly, Murtoyo (2023) found that CFIM-based family psychoeducation significantly improved caregiving abilities among families of patients with schizophrenia through structured training and counseling.

In addition to benefits for patients and families, CFAM and CFIM also enhance nurses' professional competencies. Broekema et al. (2018) reported that CFAM- and CFIM-based training programs significantly improved nurses' perceptions and skills related to family involvement in care, highlighting the importance of family-centered nursing practice.

Overall, despite a wealth of evidence supporting the effectiveness of the Calgary Family Assessment Model (CFAM) and the Calgary Family Intervention Model (CFIM) in family nursing practice, empirical reports describing their practical application in managing asthma in households exposed to secondhand smoke are limited, particularly in community-based settings. Most existing

studies emphasize educational outcomes or clinical indicators without adequately explaining how family assessment findings are translated into actionable, family-centered interventions.

This case report addresses this gap by providing a detailed description of how a CFAM-guided assessment informed a CFIM-based intervention to modify unhealthy family routines, facilitate therapeutic communication, and support realistic behavior changes related to smoking and asthma management. By documenting practical strategies and lessons learned from direct family engagement, this study provides new insights into the operationalization of the CFAM and CFIM in family nursing care and offers a framework applicable to nurses managing asthma in families where secondhand smoke exposure persists. Family assessment data were obtained through interviews, observations of the home environment and family interactions, and subjective reports from family members (Friedman, 2010). Therefore, based on the above background, this paper aims to present the application of CFAM and CFIM in family nursing care for asthma patients who are exposed to smoking habits in the household.

Research Methods

This study employed a descriptive case report design to provide an in-depth examination of family nursing care for a patient with asthma exposed to household smoking. A case report approach was selected to allow detailed exploration of assessment, planning, intervention, and evaluation processes within a real-life family context.

The Calgary Family Assessment Model (CFAM) and the Calgary Family Intervention Model (CFIM) were applied as conceptual and practice frameworks within the nursing process, rather than as research instruments or outcome measurement tools. CFAM was used to guide the family assessment phase, enabling systematic identification of family structure, developmental stage, and functional dynamics. Based on the findings of the CFAM-guided assessment, a Nursing Care Plan (NCP) was developed. The NCP operationalized nursing diagnoses, goals, and interventions in accordance with the nursing process. CFIM subsequently served as a framework for planning and implementing family-centered nursing interventions, focusing on cognitive, affective, and behavioral domains of family functioning (Wright & Leahey, 2013; 2019).

The study was conducted from December 31, 2024, to January 22, 2025, in Sukamentri Subdistrict, Garut City. The study sample consisted of one patient with asthma and their family, selected using purposive sampling. Inclusion criteria were: (1) a confirmed diagnosis of asthma, (2) residence with family members, (3) exposure to household smoking, and (4) willingness of the patient and family to participate in family nursing care. The selection of a single case was justified by the study's aim to achieve an in-depth understanding of the application of CFAM and CFIM in family nursing practice rather than to produce statistically generalizable findings.

Data collection was based on the family nursing care process, including assessment, analysis, and intervention. The CFAM approach was used to explore how the family functions, communicates, and copes with health problems. CFAM comprises three main components: structural, developmental, and functional aspects of the family. Data were obtained through family interviews, development of family-based intervention plans, and assessment of family strengths and weaknesses in addressing health issues. Nursing diagnoses in this study were determined using the Indonesian Nursing Diagnosis Standards name as Standar Diagnosis Keperawatan Indonesia (SDKI) as a national diagnostic reference (Tim Pokja SDKI DPP PPNI, 2016).

The nursing interventions were guided by the Calgary Family Intervention Model (CFIM), which consists of three core domains: cognitive (knowledge), affective (emotions), and behavioral (actions). The cognitive domain focused on changing the family's understanding and perceptions of their situation through education, information, clarification of events, and correction of misconceptions. The affective domain aimed to assist the family in managing and expressing emotions, utilizing

empathetic listening, emotional validation, and support for emotional communication within the family. The behavioral domain emphasized actionable changes the family could implement to enhance function, such as establishing new routines, planning care, strengthening functional communication, or negotiating roles.

The intervention duration of 15–30 minutes was chosen based on clinical, pedagogical, and contextual considerations within community-based family nursing practice. Clinically, this duration is considered sufficient to maintain the attention and active engagement of all family members without causing cognitive or emotional fatigue, particularly in families with elderly members and patients with chronic illnesses such as asthma. From a health education perspective, short sessions allow for focused, interactive, and easily understood information delivery, as well as providing opportunities for families to ask questions and discuss their experiences. Furthermore, in the context of home visits, a duration of 15–30 minutes is considered feasible and realistic, given the limited time available to families and nurses. This approach also aligns with the principles of the Calgary Family Intervention Model (CFIM), which emphasizes brief but meaningful interventions through therapeutic conversations, enabling gradual and sustained cognitive, affective, and behavioral changes to be facilitated.

Evaluation of nursing care was conducted through brief Q&A with the patient and family, followed by their verbal feedback to ensure comprehension of the interventions provided. Ethical principles adhered to in this case report included obtaining informed consent, meaning that the patient and/or family members agreed to the proposed nursing actions or procedures after receiving comprehensive information.

The researcher first informed the client/subject about the planned actions, interview questions, use of data, type of interventions, potential benefits, possible risks, and any other relevant details concerning the research process (Eungoo & Hwang, 2021). To maintain confidentiality and protect the identity of participants, all names were anonymized using initials or codes.

Results

Nursing Care Implementation

Nursing care was provided to Mr. R's family over a period of 20 days, covering the phases of assessment through evaluation. Each session lasted approximately 15–30 minutes, adjusted according to the family's availability.

Nursing Assessment

The assessment of Mr. R's family was conducted on Tuesday, December 31, 2024. The assessment utilized the Calgary Family Assessment Model (CFAM), which includes structural, developmental, and functional dimensions.

Structural Assessment

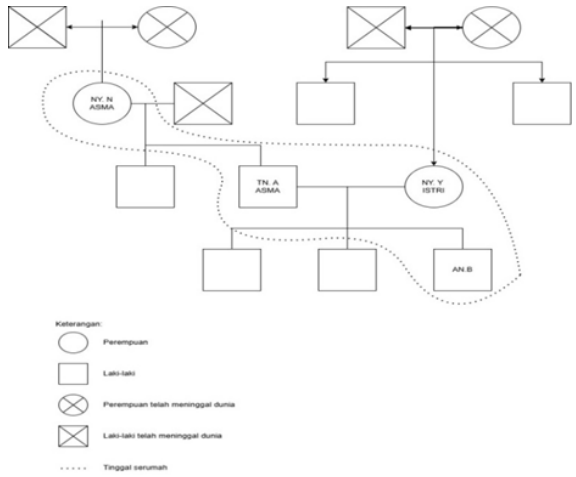
In terms of internal family structure, Mr. R is a 61-year-old retired civil servant and a passive smoker. He resides in the same household with his wife, Mrs. Y (52 years old), their son, An.B (16 years old), and his mother, Mrs. N (81 years old). Both Mr. R and his mother have a history of asthma, which is genetically inherited. Their asthma has been persistent over time, and although they seek medical treatment when symptoms worsen—particularly at night or during weather changes—management tends to be irregular and symptom-based.

Mr. R is frequently exposed to cigarette smoke within the home environment, as he himself smokes indoors and lives in a community with high exposure to secondhand smoke, which further exacerbates his asthma. He spends most of his time tending a small shop in front of his house. Mrs. Y manages household responsibilities, their son assists with chores, and Mrs. N experiences severe and recurrent asthma, especially when her physical condition declines. The family exhibits open and democratic communication, with Mr. R, as the head of the household, serving as the primary decision-maker.

Genogram

The use of genograms is essential in

therapeutic communication as a tool to broaden the scope of dialogue with families (Leahey & Wright, 2016). The following is the genogram of Mr. R's family.



In terms of external structure, the family has access to primary healthcare facilities but does not utilize them optimally due to limited understanding and health literacy. The family maintains generally positive social relationships with neighbors and local community leaders (RT). The contextual structure reveals a Sundanese cultural background, Islamic faith, and long-standing habits—such as smoking inside the house—that are perceived as normal. However, this practice significantly impacts the health of other family members, especially those with respiratory conditions such as asthma.

Developmental

In the developmental dimension, the family is currently in the phase of raising a child and caring for an elderly parent, which presents both emotional and physical challenges. Based on Friedman's theory (2010), Mr. R's family is in Stage 4 of the family life cycle, as Mr. R and Mrs. Y have a 16-year-old son. This stage includes families with children aged 13–20 years. The developmental tasks of this stage include:

1. Balancing independence and responsibility as adolescents mature into adulthood.
2. Maintaining intimacy and connection within the family.
3. Promoting open communication between parents and children while avoiding arguments, suspicion, and hostility.
4. Preparing for changes in family roles and rules to accommodate the developmental needs of family members.

The family has fulfilled these developmental tasks by supporting their child's growth and caring for elderly parents. However, the current developmental challenges include managing chronic illnesses in both Mrs. N and Mr. R, as well as adjusting to Mr. R's recent retirement.

Functional

In the functional dimension, the family demonstrates adequate instrumental function, particularly in fulfilling basic daily needs. However, the health function is impaired due to the absence of a healthy lifestyle. In daily life, Mr. R and Mrs. Y work together to run a small store at the front of their house. Mr. R often smokes in or around the house. Their son, An. B, occasionally helps with household chores, while Mrs. N has difficulty engaging in daily activities due to her severe asthma. The family faces challenges in managing health due to the genetic presence of asthma and Mr. R's smoking habit. In terms of expressive function, the family maintains open communication, with the head of the household acting as the primary decision-maker. No role conflicts are present; Mr. R fulfills his role as head of the family, while Mrs. Y functions effectively as a wife, mother, and daughter-in-law, despite her own health conditions. Decision-making within the household is democratic, with final decisions resting with Mr. R.

Nursing Diagnosis

Based on the assessment data, the identified family nursing diagnosis is:

Ineffective family health management related to lack of knowledge about asthma triggers and prevention strategies.

Subjective Data:

Mrs. Y reported that she sometimes hears wheezing sounds when Mr. R sleeps under certain conditions. Mrs. N stated that asthma

runs in the family, passed down from her parents to Mr. R.

Objective Data:

Mrs. N was observed using accessory muscles to breathe and appeared short of breath when speaking. Mr. R has a history of asthma, although his vital signs were within normal limits at the time of assessment. The family showed limited knowledge about asthma prevention and trigger management. Mr. R was unaware that smoking indoors could trigger asthma attacks. The underlying etiology of ineffective health management in this family is their lack of understanding about asthma exacerbation factors—such as exposure to cigarette smoke, dust, weather changes, or other allergens—and their limited knowledge of preventive measures and early intervention. This lack of awareness impairs the family's ability to effectively manage the health conditions of its members. The results of the physical assessment of Mr. R's family are presented as follows (Table 1).

Table 1. Family Vital Signs Anamnesis

Name	Blood Pressure	HR	RR	SpO2
Tn. R	130/80 mmHg	76 x/minute	21 x/ minute	97%
Ny. Y	118/76 mmHg	90 x/ minute	21 x/ minute	99%
An. B	110/75 mmHg	98 x/ minute	22 x/ minute	100%
Ny. N	130/70 mmHg	81 x/ minute	27 x/ minute	89%

Table 2. CFIM Intervention

Type of CFIM Intervention	Intervention	Response	Evaluation
Cognitive	Provided family education on asthma and the dangers of smoking using simple language and a basic leaflet	The family was enthusiastic and actively engaged in the Q&A session	The family demonstrated understanding and was able to recall the educational content provided

Family Nursing Intervention and Implementation Using the Calgary Family Intervention Model (CFIM)

Based on the assessment findings, nursing interventions were carried out using the Calgary Family Intervention Model (CFIM), which focuses on three primary domains: cognitive, affective, and behavioral functioning within the family. The goal of the intervention was to enhance the family's capacity to manage chronic health problems and unhealthy habits by strengthening communication patterns, role distribution, and family coping mechanisms (Table 2).

First Intervention Session

During the first intervention session, educational activities were conducted using a leaflet containing information about asthma and the dangers of smoking, including management strategies, warning signs of exacerbation, and preventive measures.

Before starting the session, the author asked the family about their existing knowledge of asthma. Following this, an educational intervention was provided focusing on asthma and the harmful effects of smoking, particularly for individuals with asthma.

After the session, the family was able to recall and explain the signs and symptoms of asthma, its management, preventive measures, and restrictions for asthma patients. As Mr. R had a habit of smoking within the household, additional education was provided on the health hazards of smoking and alternative coping strategies, such as smoking substitution. The family responded positively, expressing their willingness to support Mr. R and help reduce his smoking frequency. The education session lasted approximately 15 minutes.

Cognitive Intervention Evaluation

Following the cognitive intervention, both the client and family demonstrated an understanding of the dangers of smoking, especially in relation to asthma. The family was able to recall the harmful substances in cigarettes, the environmental impact of

smoking, and its physiological effects on the body. They also identified sugar-free gum as one alternative strategy for smoking substitution. Additionally, the family could accurately describe asthma-related content such as triggers and prevention strategies. They were able to demonstrate techniques such as the semi-Fowler's position and deep breathing relaxation exercises (Table 3).

Table 3. CFIM Intervention

Type of CFIM Intervention	Intervention	Response	Evaluation
Affective	**Family counseling session**	**The family expressed concern about Mr. R's difficulty in quitting smoking.**	**The family participated in the counseling session and improved their intra-family communication.**

Second Intervention Session

The second intervention session was conducted on the following day, during which a family counseling session was held to create a safe space for communication about how the family copes with physical and psychological stress. During the session, Mrs. Y expressed her frustration with her husband's difficulty in quitting smoking, despite his history of asthma. The author facilitated an open dialogue among family members, encouraging empathy and emotional validation.

As a result of the counseling session, family members gained a deeper understanding of each other's concerns, began to offer mutual support and motivation, and Mr. R became more aware of how his smoking habit affects both himself and his family.

Affective Intervention Evaluation

Following this affective intervention, Mr. R acknowledged his family's concerns and agreed to reduce the frequency of smoking and to refrain from smoking indoors. Mrs. Y expressed her happiness, stating that in recent days, Mr. R had noticeably reduced his smoking and showed significant positive changes. The family collectively stated their commitment to supporting one another in pursuing a healthier lifestyle in the future (Table 4).

Table 4. CFIM Intervention

Type of CFIM Intervention	Intervention	Response	Evaluation
Behavioral	**Established family agreement, practiced deep breathing relaxation, and provided education on its benefits**	**The family agreed to adopt a healthier lifestyle, and Mr. R stated he would reduce his smoking frequency**	**Five days after the intervention, Mr. R had reduced his cigarette consumption from 6 to 3 cigarettes per day**

Third Intervention Session (Behavioral Intervention)

During the third session, which focused on behavioral intervention, the author assisted the family in establishing agreements to initiate behavioral changes. These included Mr. R agreeing to smoke outside the house and reduce the frequency of smoking, and both Mr. R and Mrs. N committing to perform simple breathing exercises at home. Additionally, the family began adopting a healthier lifestyle moving forward.

Behavioral Intervention Evaluation

As a result of this behavioral intervention, Mr. R reduced his smoking from six cigarettes per day to three. Mrs. Y supported this change by facilitating smoking alternatives, such as preparing ginger tea and providing sugar-free chewing gum. The family also began participating in Posbindu (integrated health post) activities in their neighborhood and became more attentive to the overall health of the household.

The evaluation results indicated that the family had started practicing healthier behaviors, particularly in reducing smoking habits and utilizing available health services through community health activities. This aligns with the findings of Mileski & McClay (2022), which state that consistent application of the Calgary Family Intervention Model (CFIM) can lead to improved long-term

health outcomes in families dealing with chronic illness.

Discussion

The application of the Calgary Family Assessment Model (CFAM) and the Calgary Family Intervention Model (CFIM) in family nursing care as a conceptual approach to families has proven effective and practical when interviewing families to collect and manage data for nursing care. In this case, the CFAM and CFIM were effective in providing nursing care to families with inherited asthma triggered by the environment and passive smoking habits. CFAM and CFIM-based assessments and interventions are not only applicable in clinical settings but are also valuable in personal and interpersonal contexts (Leahey & Wright, 2016). Assessment through therapeutic communication is crucial in deepening conversations with families, and the CFIM enhances communication, collaboration, and therapeutic dialogue between nurses, patients, and families (Mileski & McClay, 2022). Nurses who implement the CFAM and CFIM report higher job satisfaction, as these models are designed to be practically integrated into clinical settings through techniques such as the 15-Minute Family Interview (Leahey & Wright, 2016).

In Indonesia, the application of CFAM and CFIM remains limited, largely because nursing diagnoses typically rely on the Indonesian Nursing Diagnosis Standards (SDKI), and interventions are guided by the Indonesian Nursing Intervention Standards (SIKI). While CFIM serves as an intervention model within CFAM, its use is not mandatory and may be substituted with SIKI. Nevertheless, CFAM and CFIM can be adopted as practical theoretical frameworks for family nursing practice in Indonesia.

Overall, the CFAM and CFIM models of family nursing support nursing care were deemed effective in managing family nursing care. Assessments conducted using the CFAM approach facilitated data collection for formulating nursing diagnoses and interventions. Interventions conducted using the CFIM approach were shown to be more easily understood by clients and yielded tangible results through changes in family lifestyles.

In the case study of Mr. R's family, the CFAM approach was used to assess structural, developmental, and functional dimensions. The structural assessment revealed a supportive internal family structure but also persistent habits, such as indoor smoking, that worsen asthma conditions. Developmentally, the family was at the stage of raising an adolescent and caring for an elderly parent—posing emotional and physical challenges. Functionally, the family exhibited open communication patterns but lacked healthy lifestyle practices. The CFIM model was then used to design and implement nursing interventions across three domains: cognitive, affective, and behavioral.

In the cognitive domain, education about asthma and the dangers of smoking successfully increased the family's understanding. This was evidenced by their ability to recall the information provided and demonstrate techniques such as deep breathing relaxation and the semi-Fowler's position. This finding is consistent with research by Mileski et al. (2022), which found that CFIM effectively enhances family engagement and understanding in home care. Other studies have also emphasized that health education within the cognitive domain forms the foundation for increasing family knowledge about illness (Nurbadriyah, 2019), and the use of leaflets as educational media is effective in improving knowledge (Barik et al., 2019).

In the affective domain, counseling interventions helped family members express their emotions and build empathy. The open dialogue between Mrs. Y and Mr. R marked a pivotal moment in strengthening emotional support, ultimately leading to behavioral changes in Mr. R, such as reducing his smoking frequency. Research by Sari & Duman (2022) supports the effectiveness of affective CFIM interventions in reducing psychological stress and enhancing communication among family members caring for chronically ill patients. Similarly, Shah (2021) found that CFIM-based affective interventions strengthen emotional bonds and foster cooperation in caregiving.

In the behavioral domain, interventions

focused on establishing family agreements to change lifestyle habits, including reducing smoking and practicing breathing exercises. Evaluation showed that Mr. R successfully decreased his cigarette consumption from six to three per day and became more aware of the impact on his family. This reduction reflects a positive behavioral shift, which is a primary goal of this CFIM domain (Wright et al., 2019). Such behavioral changes illustrate the model's success in prompting real-life interventions in daily family routines.

Beyond encouraging behavior change, this approach also motivated the family to actively participate in community health initiatives, such as posbindu (integrated health posts). This suggests that empowering families through education and direct involvement can strengthen overall health management. These consistent outcomes align with the findings of Broekema et al. (2018), who reported that nurses trained in CFAM and CFIM demonstrated greater competence in educating and involving families effectively.

In summary, the combination of CFAM and CFIM in supporting family nursing care can improve nurses' assessment and education of families, and increase family involvement in chronic disease management within the family. These improvements have a direct impact on risk reduction for families. This approach is highly relevant for community nursing practice, particularly in areas with limited access to health information and high-risk environmental practices.

Conclusion and Recommendations

The application of the Calgary Family Assessment Model (CFAM) and the Calgary Family Intervention Model (CFIM) concepts to nursing care has shown potential benefits in increasing family understanding of asthma, improving communication, and encouraging positive behavior changes related to smoking in the home, as well as enhancing the role of nurses in education.

However, evidence from this single case report is limited in scope and duration. Behavioral changes, such as decreased smoking frequency, were only observed in the short term, and the long-term sustainability of these results cannot be assessed.

This study highlights several gaps that require further investigation. First, the effectiveness of CFAM-CFIM-guided interventions needs to be evaluated in studies with larger and more diverse family samples to increase transferability. Second, future research should include longer follow-up periods to examine the persistence of behavioral and health outcomes. Third, the use of standardized outcome measures in conjunction with qualitative family assessments can strengthen the evaluation of intervention effectiveness.

This case report highlights several practical implications for family nursing practice. First, it supports the integration of structured home visits using the CFAM–CFIM framework to identify family routines, environmental risk factors, and communication patterns that influence asthma management in households exposed to secondhand smoke. Second, the findings underscore the importance of family-centered educational strategies that go beyond information delivery to incorporate therapeutic communication, emotional support, and negotiated behavior change, particularly related to indoor smoking practices. Finally, this study demonstrates the need for skills training in brief family assessment, therapeutic interviewing, and intervention planning across cognitive, affective, and behavioral domains. Strengthening nurses' competencies in these areas can enhance the effectiveness of family-based asthma management and support sustainable health behavior change at the household level.

Further research is recommended to explore the application of CFIM-based interventions across various chronic conditions and community settings, and to examine how structured educational tools and ongoing nurse-family collaboration influence long-term family health behaviors.

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