

A Comparison, by Quantitative and Qualitative Methods, Between the Self-Management Behaviors of Parents With Asthmatic Children in Two Hospitals

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ABSTRACT: This study compared the self-management behaviors of parents with asthmatic children staying in two hospitals and explored barriers to self-management behaviors by interviewing. 227 parents were recruited for quantitative analysis by completing a self-report structured questionnaire, 94 of these parents were from the Taipei area and 133 were from the Taoyuan area. Sixteen parents were interviewed from this population. The results indicated that the parents in the Taoyuan area had younger age, lower socioeconomic status (SES), and higher exercise limitations for children. Their knowledge, enabling factors, and self-management behaviors were also lower than their counterparts in the Taipei area. The determining factors of self-management behaviors were socioeconomic status, self-efficacy, sources of education, and perceived effectiveness (Adjusted $R^2 = .593$) in 227 parents. Six major themes about the influencing factors of self-management were deduced from the interview data: lack of understanding and dislike of the asthma label, less self-perceived severity, lack of understanding about asthma medication, lack of confidence in environmental controls, financial burden of anti-mite products, and doubt about effectiveness. Three major barriers to self-management behaviors of parents in the Taoyuan area were inconsistent use of alternative treatments, overdependence on medical service, and lack of use of peak flow meter. Parents with asthmatic children living in the Taoyuan area had poorer self-management behaviors than those in the Taipei area, and SES was one of the determining factors. The health beliefs of Taoyuan parents included many misconceptions. Conducting the educational needs assessment through quantitative and qualitative methods could provide proficiency information for designing educational content appropriate to specific populations.

Key Words: asthma, parent, self-management.

Introduction

The prevalence and hospital admission rate of asthma have risen recently in Taiwan. The incidence and severity of asthma among school-aged children have increased during past 20 years in Taiwan (Hsieh, 1995; Huang, 1999). Reports from Environmental Protection Administration (EPA) revealed that the prevalence rate of asthma in high school children was 8.5% and 18.8% children were suspected of having asthma (Environmental

Protection Administration [EPA], 1996). Huang (1997) found that the severity of asthma increased from 1975 to 1990. The proportion of severe asthma increased from 8% to 20%, meaning that children had more than 10 attacks per year. It is obvious that childhood asthma has become more prevalent in recent years and is increasingly severe. Asthma has become one of the most common chronic diseases among children in Taiwan. This chronic disease affects children's psychosocial adaptation by causing absence from school, poor academic performance, and low

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Received: November 4, 2004 **Revised:** February 18, 2005 **Accepted:** March 4, 2005

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levels of physical activity (Bussing, Halfon, Benjamin, & Wells, 1995; Celano & Geller, 1993; Perrin, MacLean, & Perrin, 1989). Educating children and their parents about self-management of asthma has become the most important intervention for asthma control. Successful self-management programs can help improve health behaviors, which leads to reduced asthma attacks, fewer signs and symptoms, a decreased mortality rate, and a better quality of life (Gibson, Ram, & Powell, 2003; Kamps & Brand, 2001; Schaffer & Tian, 2004; Wolf, Guevara, Grum, Clark, & Cates, 2003). Educational interventions should be meaningful to the patient, learner-centered to incorporate the patient's needs, and sensitive to the patient's cultural influences (Musto, 2003). However, many self-management programs were developed without regard patients' unique needs, which limited the effects of education. Few asthma educational programs were developed based on a theoretical framework (Clark, Evans, Zimmerman, Levison, & Mellins, 1994; Rachelefsky, 1987). Clark et al. (1994) developed asthma education based on self-regulation theory to promote health behaviors by the use of behavioral science (Clark et al., 1994). Systematization of nursing assistance under Orem's nursing theory of self-care deficit was developed by Monteiro, da Nobrega, and de Lima (2002). The utilization of protection motivation theory by Schaffer and Tian (2004) also found the good educational results. Mostly the theories utilized in the previous studies were based on the individual level, and did not consider interpersonal and reinforcing factors. Green and Kreuter (1999) revised the PRECEDE-PROCEED model to guide the development of health education in different situations for different populations. This model classified the factors that affect behaviors into predisposing, enabling, and reinforcing factors, which made it possible to group specific situations on the basis of types of interventions available in health education and promotion. This model also emphasized using multiple methods to explore specific educational needs when developing an educational program. Mixed methods provided more proficiency information for developing a health education program. Identifying the determining factors and experience of self-management behaviors of parents with asthmatic children on the basis of the PRECEDE-PROCEED model of different target populations can help in the development of problem-focused educational programs. Mesters, Meertens, Crebolder, and Parcel (1993) developed an educational program for parents of preschool children with asthma in the Netherlands that was based on the PRECEDE model, using

qualitative and quantitative methods (Mesters, Pieterse, & Meertens, 1991; Wolf et al., 2003). From content analysis by interviewing successful self-managing parents with asthmatic children, 12 influence determinants were observed and categorized as predisposing, enabling, and reinforcing factors (Chiang, 1999; Chiang, Huang, & Lu, 2003). These previous studies results supported the educational diagnosis for parents with asthmatic children based on the PRECEDE-PROCEED model for developing asthma education. But these results limited to only one area in one hospital may not be applicable to other specific target populations.

There is a discrepancy of socioeconomic status (SES) in different populations in Taiwan. The results of earlier studies indicated that family income and SES could influence the self-management behaviors of parents (Chiang et al., 2003). The relationship of socioeconomic factors to asthma has been tested with various research purposes (FitzGerald, 1994). Lower income and socioeconomic deprivation have been associated with increased asthma prevalence and morbidity. Some studies have shown that people with lower SES might have higher dust-mite antigen levels in their households, higher environmental tobacco smoke exposure, difficulties in accessing asthma care, underutilization of inhaled corticosteroids, more dependence on emergency management for asthma, and more hospital visits (Amre, Infante-Rivard, Gautrin, & Malo, 2002; FitzGerald, 1994; Holfon & Newacheck, 1993;). Investigating the determining factors of the self-management behaviors of parents with asthmatic children in different areas with different SES will help in the development of appropriate health education in different target populations. The conceptual framework of this study was developed on the basis of the PRECEDE-PROCEED model. The purpose of this study was to compare the self-management behaviors and influencing factors of parents with asthmatic children in two hospitals in northern Taiwan by quantitative methods, and the lived experience of parents caring for asthmatic children in two hospitals by qualitative method.

Methods

Design and Participants

Research using multiple methods is a growing trend to provide complementary data, enhance theoretical insights,

increase incrementality, and enhance validity (Polit, & Beck, 2004). In the present study, a survey was used to identify differences in the self-management behaviors of two target populations, and in-depth interviewing was used to provide complementary data regarding parents' life experience of caring for children with asthma. The Chang-Gung Memorial Hospital has two hospitals in northern Taiwan: one is located in Taipei County, with residents of higher SES, and the other is located in Taoyuan County, with people of lower SES. In the first stage of our study, quantitative methodology was used to compare self-management behaviors and possible influencing factors for parents from the two different hospitals, using a self-report structured questionnaire developed for a previous study (Chiang et al., 2003). Purposive sampling was used to recruit participants meeting the inclusion criteria, which were: children aged 3-14 with physician-diagnosed asthma for at least three months, without major organ disease or mental disease. Data were collected from self-report questionnaires that were completed by parents. Finally, 227 parents were recruited from the outpatient departments of the two hospitals, comprising 133 from the Taoyuan area hospital and 94 from the Taipei area hospital. After four months of data collection, most parents in the two outpatient departments had completed the questionnaire. One goal of the proposed study was to test the null hypothesis that the two populations' SES means are equal. The criterion for significance (α) was set at .05. The test was 2-tailed, which means that an effect in either direction will be interpreted. With the proposed sample size of 100 and 90 for the two groups, the study will have a sample power of 1.0 to yield a statistically significant result. This computation assumes that the SES mean difference is 9.1 (corresponding to means of 39.6 versus 30.5) and the common within-group standard deviation is 10.2. This effect was selected as the smallest effect that it would be significant to detect, in the sense that any smaller effect would not be of clinical or substantive significance. It is also assumed that this effect size is reasonable, in the sense that an effect of this magnitude could be anticipated in this field of research (Borenstein, Rothstein, Cohen, Schoenfeld, & Berlin, 2000). During the second data-collection phase, parents were selected from the previous populations with the agreement of and referred by doctors by typical case sampling for qualitative methods (Polit & Beck, 2004). Semistructured in-depth interviews were used to explore the experiences of parents, including how they manage

their children's asthma attacks and how they prevent those attacks, what kind of management and/or interventions were successful for them, and the major barriers to successful management. All interviews were conducted at the parents' homes, to ensure quiet and privacy, which help parents to explore their real feelings. The interviews took approximately 1-2 hours and lasted until both the parents and the researcher felt that no new information was emerging. Because the parents were good informants, the researcher interviewed 16 parents to reach data saturation. In total 16 parents (eight parents in each area) were interviewed. They were one father and eleven mothers, with ages from 34 to 41 and more than one year's experiences of caring for an asthmatic child. Ten of them had a college educational background, and the others had a high school educational background. Half of their children were boys, aged from 4 to 10. Each interview was recorded on tape and transcribed after obtaining their permission.

Instruments

A self-report, structured questionnaire was reported in a previous study (Chiang, et al., 2003), including demographic data, 12 influencing factors, SES, and self-management behaviors. Demographic data-age, gender, family history, asthma severity, duration of disease, and limitations in physical activity-were included in the questionnaire. SES was calculated on the basis of the index developed by Hollingshead and Redlich (1958), which computed two factors index of social position-educational and occupation. Socioeconomic status was classified into five levels based on the criteria (Level I: 52-55, Level II: 41-51, Level III: 30-40, Level IV: 19-29, Level V: 11-18). This index has been used by many researches in Taiwan.

A panel of 10 experts, including one health educator, four nurses and five physicians specialized in research tool design and/or with experience treating children with asthma, was consulted to evaluate the appropriateness on a four-point scale. All instruments had acceptable content validity, with a content validity index (CVI) of approximately 83%-90% (Waltz, Strickland, & Lenz 1991). Cronbach's α was used to test the reliability of the instruments, to estimate the internal consistency or homogeneity of a measure composed of several items (Nunnally & Bernstein, 1994).

Predisposing factors

Four subscales were used to measure these factors. *Perceived severity* was a four-point rating scale in which 1

indicated mildly severe and 4 indicated very severe. *Asthma knowledge* was composed of 35 true-false questions regarding general knowledge. The reliability of the instrument was .81 for the Kuder-Richardson-21 reliability coefficient. *Asthma attitude* was a tool with 25 questions using a 5-point Likert rating scale. The reliability of the instrument was .82 for Cronbach's α . *Self-efficacy* was a 15-item six-point rating scale with Cronbach's α .91.

Enabling factors

Three subscales were used to measure these factors. *Household amenities/asthma control facilities* consisted of questions about six items that help control and reduce asthma attacks include: air conditioners, air purifiers, anti-mite bed sheets, peak flow meters, anti-mite vacuum cleaners, and humidity controllers. Participants got one point for each controlled item. The higher the score, the more facilities were used. *Convenience of access to health care* was composed of four questions about time and distance of transport to the hospital, waiting periods in the outpatient department, and the time required for checking into hospital systems. Higher scores indicated that parents perceived that access to hospital was convenient. *Health education sources used* asked questions regarding any kind of education received, either through formal instruction or through informal teaching by health professionals or other resources like the Internet. This factor attempted to gauge how many educational resources parents had access to. Each item counted for one point. The higher the score, the more health education about asthma had been acquired.

Reinforcing factors

Five subscales were used to measure these factors. *Profession-patient communication* was a tool composed of 10 items measuring subjective perceptions about the quality of interaction between parents and doctors. A five-point Likert rating scale was used that had a Cronbach's α reliability of .75. *Perceived effectiveness* was an 18-item, six-point Likert scale that evaluated the effectiveness perceived by parents about self-management preventive measures and attack treatment behaviors. The reliability of the instrument was .92 for Cronbach's α . *Support from family and professionals* were two 15-item, five-point Likert rating scales that were adopted from Cohen's (1985) Interpersonal Support Assessment Index. The first section explored the perceived level of personal support from family and friends, and the second section explored

the perceived level of support by various health care professionals. Each section of the scale included items measuring emotional, informational, and instrumental support. The reliability of support from family was .96 for both Cronbach's α . The reliability of support from professionals was .95 for both Cronbach's α . *Children's cooperation* was a six-item, six-point Likert rating scale about behaviors that required children's cooperation. The reliability of the instrument was .82 for Cronbach's α .

Self-management behavior

A tool with 21 self-management behaviors that has good reliability and validity has been developed (Chiang, Huang, & Chao, 2001). A 21-item, five-point Likert rating scale that included preventive (eleven items), management (seven items), and assessment (three items) behaviors was constructed for previous research. The reliability of the instrument was .88 for Cronbach's α .

Data was analyzed by descriptive and inferential statistics in SPSS for Windows (version 10.0). Chi-square tests and t-tests were used to identify statistically significant differences between data from two areas. Multiple-regression analysis was used to explore the determining factors of self-management behaviors. Calculating variance inflation factors were examined for each model, to diagnosis multicollinearity.

The semi-structured interview with clearly defined interview guidelines was conducted by the first author. Three experts specialized in treating children with asthma, including one pediatrician, one pediatric nurse, and one nurse faculty, reviewed the 10-question guideline in order to direct the interview process. Each interview took approximately 60-120 minutes. The whole process was tape recorded with the permission of parents. The entire tape was transcribed verbatim as a typed manuscript as soon as possible after the interview. The truth-value, applicability, consistency, and neutrality were established on the basis of methods outlined by Lincoln and Guba (1985). Content analysis was used for data analysis with the constant comparison process during the study process until the categories revealed saturation. All transcriptions were repeatedly analyzed, and words and phrases related the experience of caring for children were highlighted, to develop a coding list and establish the intracoder reliability. Intercoder reliability was repeatedly and separately analyzed for one of the transcripts by the first author and a qualitative research expert. After discussion between these

two decoders, the same coding was computed. The consistency of content analysis coding between the two decoders was greater than 85%. The first author, who has more than 15 years of experience in pediatric nursing, collected all data, following the interview guidelines, to ensure the credibility of the study. In order to improve the neutrality, all interviews were conducted in an atmosphere of trust and empathy in an attempt to ascertain more information about parents' experience of caring for children with asthma.

Ethical Issues

The Review Board of Chang-Gung Hospital gave permission for this research. The parents were given full explanations about the procedure we would follow and were informed that they were free to drop out at any time.

Results

Demographic Data

Table 1 shows differences in parents' ages for the two target groups; the age of parents in the Taipei area (36.4 years) was significantly greater than that of the parents in the Taoyuan area. Asthma severity was not significantly different between the children in the Taipei and Taoyuan areas. As indicated in Table 1, the SES of parents in the Taipei area was significantly higher than that of the parents in the Taoyuan area. The exercise limitations for children in the Taoyuan area were significantly higher than in the Tai-

pei area. Seventy-one (75.53%) of the asthmatic children in the Taipei area were male, a proportion that was significantly higher than the 84 (63.15%) in the Taoyuan area. Parents' experiences of caring for the asthmatic children and the family asthma history were not significantly different between the two areas. Children in the Taoyuan area had a longer duration of disease than the children in Taipei.

Self-management Behaviors and Influencing Factors

Parents in the Taoyuan area demonstrated less self-management behaviors, especially managing behaviors, in caring for asthmatic children than parents in the Taipei area. There was no significant difference in preventive and assessment behaviors between the two populations (see Table 2).

All influencing factors were classified as predisposing, enabling, or reinforcing factors on the basis of the PRECEDE-PROCEED model. Scores for knowledge about asthma for both parent groups were poor: 70% (24.5/35) for the Taipei group and 63.3% (22.2/35) for the Taoyuan group. This indicates that parents had some misconceptions about asthma and its care. The differences in enabling factors—including household amenities/asthma control facilities, convenience of access to health care, and health education sources—used between the two groups indicated that parents living in the Taoyuan area perceived significantly fewer enabling factors than parents in the Taipei

Table 1.
Demographic Data of Participants Between Taipei and Taoyuan Areas (N = 227)

Variable	Taipei area (n = 94)			Taoyuan area (n = 133)			t	χ^2	p	
	n	%	M	SD	n	%				M
Parents' age			36.40	5.04			33.72	3.90	-4.480	.000**
Children' age			6.55	1.97			6.60	2.14	0.168	.867
Asthma severity			2.21	0.57			2.23	0.75	1.112	.263
Socioeconomic status			39.59	10.24			30.45	10.20	-6.636	.000**
Children's exercise limitation (score 0-5)			0.82	0.39			2.24	0.81	17.619	.000**
Boy of children	71	75.53			84	63.15			4.985	.026*
Experience of caring Asthmatic children	14	14.90			14	10.50			0.971	.325
Family history of asthma	72	76.60			93	69.90			1.560	.213
Duration of disease									103.220	.000**
< 1 year	71	76.30			25	18.80				
1~2 years	22	23.70			23	17.30				
> 2 years		0			85	63.90				

* $p < .05$; ** $p < .001$.

Table 2.
Comparison of Independent Variables and Self-management Behaviors Between Two Areas (N = 227)

Variables	Taipei area (n = 94)		Taoyuan area (n = 133)		t	p
	M	SD	M	SD		
Predisposing Factors						
Perceived severity	1.70	0.83	1.88	0.92	1.488	.138
Asthma knowledge	24.47	5.70	22.15	5.61	-2.964	.003*
Asthma attitude	120.71	11.77	121.95	11.08	.805	.422
Self-efficacy	67.24	10.62	64.99	11.47	1.483	.140
Enabling Factors						
Facilities of asthma control	3.41	1.35	3.02	1.30	2.188	.030*
Convenience of access to health care	11.63	2.67	14.20	3.57	-6.160	.000**
Sources of education	1.01	0.65	0.32	0.49	-9.139	.000**
Reinforcing Factors						
Family support	61.72	13.00	60.05	13.59	-0.907	.365
Profession support	55.04	14.40	52.00	12.46	-1.545	.124
Professional-patient communication	38.61	5.19	38.60	4.56	-0.007	.994
Perceived effectiveness	82.40	11.49	81.11	12.46	-0.726	.469
Children's cooperation	29.48	4.27	29.11	4.60	-0.620	.536
Self-Management Behaviors						
Prevention behaviors	84.70	10.29	81.85	10.43	-1.972	.050*
Management behaviors	45.74	5.32	45.27	5.32	-0.649	.517
Assessment behaviors	25.29	4.13	23.69	4.13	-3.015	.003*
Assessment behaviors	13.67	3.78	12.89	3.78	-1.536	.126

*p < .05; **p < .001.

area. There were no significant differences among all reinforcing factors between the two groups.

Determining Factors of Self-management Behaviors between the Two Groups

The relationship between the self-management behavior score and asthma severity, duration of disease, and 12 influencing factors was analyzed by a multiple-regression analysis for all parents and separate groups of parents (Taipei vs. Taoyuan; see Table 3). Our results showed that SES, self-efficacy, sources of education, and perceived effectiveness were significant determinants of the self-management behaviors of all 227 parents. The significant determinants of self-management behaviors for parents in the Taipei area were perceived severity and self-efficacy. The significant determinants of self-management behaviors for parents in the Taoyuan area were self-efficacy, sources of education, and perceived effectiveness (see Table 3).

Variance inflation factors were < 10 for these three models. A multicollinearity assessment among the interactions of the independent variables indicated that interrelatedness was not significant.

The Interview Data

To complement the quantitative data, the analysis of parents' life experiences was categorized as predisposing, enabling, and reinforcing on the basis of the categories and definitions in the PRECEDE-PROCEED model (Green & Kreuter, 1999).

Predisposing Factors

Less understanding and dislike of the asthma label

Parents who lived in the Taoyuan area had less knowledge about asthma disease than parents in Taipei. Some of them had treated their children for influenza for a period of time before realizing that the illness could be asthma. They could not differentiate between the symptoms of asthma and those of the common cold. This diagnostic label seems too difficult for these parents to admit. When asked, "What kind of disease does your child have," they would respond hesitantly and with uncertainty. Some parents did not like to use the word "asthma" to describe their children. The word for "asthma" in Mandarin Chinese means "cannot breathe" or "difficulties breathing". It was noted that par-

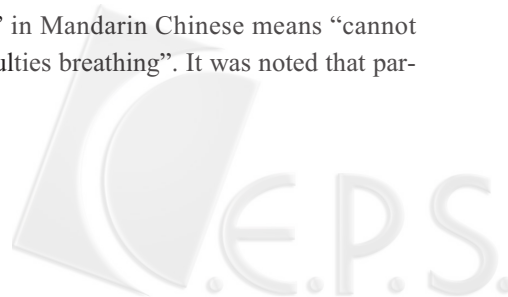


Table 3.
Multiple Regression of Self-management Behaviors of Parents (N = 227)

Influencing factors	Taipei area (n = 94)		Taoyuan area (n = 133)		Total parents (n = 227)	
	Standard β	p	Standard β	p	Standard β	p
Socioeconomic Status (SES)					.107	.033*
Asthma Severity	.035	.309	.085	.259	.050	.411
Duration of Disease	-.034	.761	.188*	.013	.109	.092
Predisposing Factors						
Perceived severity	.257	.021*	.024	.748	.102	.101
Knowledge	-.210	.190	.112	.227	-.032	.655
Attitude	.077	.597	.093	.287	.063	.382
Self-efficacy	.396	.012*	.209	.027*	.325	.000**
Enabling Factors						
Facilities of asthma control	.066	.574	-.056	.538	-.002	.976
Convenience of access to health care	-.063	.612	-.022	.759	-1.131	.261
Sources of education	-.215	.131	.184	.016*	.260	.000**
Reinforcing Factors						
Family support	-.054	.714	.066	.393	.051	.441
Professional support	.144	.318	.003	.968	.059	.406
Professional-patient communication	-.046	.729	.136	.136	.039	.602
Perceived effectiveness	.228	.067	.553	.000**	.392	.000**
Children's cooperation	.047	.599	-.013	.877	.116	.098
F	4.791**		11.622**		13.615**	
R ²	.670		.705		.640	
Adjusted R ²	.530		.645		.593	

* $p < .05$; ** $p < .001$.

ents did not demonstrate good self-management behaviors unless they had a good understanding of asthma.

Less severity perception

Many parents avoided admitting that their child had moderate asthma. They asked the researcher "Is that right? If my daughter did not catch a cold, she would not have gotten asthma. She just has a weak airway and allergic reactions.... she has mild [asthma]."

Lack of understanding about asthma medication

Some parents living in the Taoyuan area could not explain each inhaler's name and the reason to use it. In contrast, the majority of parents in the Taipei area were familiar with medications or puffers for asthma, such as Berotec (a β_2 agonist, Fenoterol) and Theophylline, yet some parents in the Taoyuan area had difficulties naming the medications prescribed for their children or differentiating the anti-inflammatory and bronchodilator. Some of them recognized Pulmicort as a bronchodilator.

Enabling Factors

Lack of confidence in environmental controls

Parents from the Taoyuan area had fewer amenities in their households. Some of them said, "I don't believe that purified air is useful to control the disease." "I cannot nurture the child in a sterile glass bowl. They need to go to school and play with other kids. How can we just change the environment at home? How do we control the environment at school?" Some interviewees in the Taipei area understood the importance of environmental control. They did their best to maintain the cleanliness of their households. It was noted that "mites" was the most familiar term in their knowledge about asthma in parents from both areas.

Financial burden of anti-mite products

Parents living in the Taoyuan area complained that the costs of some supplies, like anti-mite bed sheets, was too expensive: "We cannot afford anti-mite bed sheets. They are too expensive." The unaffordability of some asthma

supplies is questionable, given that the average family income for people in Taiwan has reached US \$17,000 per year.

Reinforcing Factors

Doubt about effectiveness

Parents from both areas expressed their concerns by asking, "What is the effective management? What do we want?" "I don't want to waste my time, effort, and money on useless stuff or amenities." These self-evaluating behaviors were obvious during the interview process. One parent from the Taipei area said, "If it works, I will try it. Why doesn't a doctor write a comprehensive book of all the things about the treatment of asthma for all of us?" The parents who managed to obtain good results of asthma control would continue to practice the strategies being used. One parent in the Taoyuan area who could not effectively manage the child's asthma told me, "I just wonder what the most effective methods to control asthma attacks are? I am tired of searching for the answer among different doctors."

Self-management Behaviors

Parents in the Taoyuan showed fewer self-management behaviors for managing asthma attacks than parents in the Taipei area, especially management behaviors. Three barriers were deduced from interview data.

Inconsistent use of alternative treatments

Parents living in the Taoyuan area tended to use alternative treatments and traditional Chinese medicine and not to use the Western asthma medications until the child had an acute attack, when they started looking into Western medical care. One parent reported, "I will buy herbal medicines or food to improve my child's immune system... Western medicines are good for symptom control but not for boosting the immune system."

Overdependence on medical service

Even when transportation was not convenient, parents from the Taoyuan area insisted on taking their children to hospitals. One parent explained, "How do I manage asthma attacks? I am very afraid that I cannot help him properly. Taking him to the hospital is the only thing I can do for him." "When he felt uncomfortable, we took him to the hospital as soon as possible, even in the middle of the

night." "I just take my kid to the emergency department when they have any signs of asthma attack." Families were stressed as a result of frequent trips to hospitals.

Lack of use of peak flow meter

Neither group of parents emphasized the peak flow meter as an assessment behavior. Some parents mentioned that they had heard about it but it was very difficult to monitor PEF every day. One parent living in Taipei had participated in an other study to use the electronic peak flow meter, but seldom used it again after the study. One parent in Taoyuan mentioned that she would use PEF when the asthma signs of her child occurred. Most parents complained that life is too busy to remember to use the PEF.

Discussions

The PRECEDE-PROCEED model is one of the most comprehensive frameworks for community health nurses to assess, plan, implement, and evaluate health education programs (Green & Kreuter, 1999). Educational diagnosis can be applied to different target populations. The first step of this study was comparison of demographic data and influencing factors, which illustrated that the majority of parents in the Taoyuan area had a lower SES, less knowledge about asthma, less educational sources, poor enabling factors, and worse self-management behaviors. These findings indicate that different target population could have different education needs and problems.

Although the children of parents living in Taoyuan with lower SES; had longer duration of asthma disease, these parents had less knowledge than parents in Taipei ($p = .003$). From interview data, these parents had less understanding of the signs and symptoms of asthma, and dislike of the asthma diagnosis label. They were also confused about the medications of asthma. They also considered asthma disease less severe. There was no significant difference of self-efficacy between the two groups. Parents in Taoyuan revealed less confidence about environmental control in the interviews. From the results of regression analysis, the self-efficacy of parents' care of their children's asthma was found to have a strong total effect on self-management behaviors of parents from both the Taipei and Taoyuan areas. These results are similar to those of other research that investigated the relationship

between self-efficacy and self-management behaviors (Sterling, 1999; van der, Klein, & Seydel, 1997). The concept of self-efficacy emerged from Bandura's social learning theory, which has been used by many health education researchers and was incorporated into the PRECEDE-PROCEED model. Improvements in self-efficacy could result in good behavioral outcomes (Bandura, 1997; Green & Kreuter, 1999).

Parents in Taoyuan had significantly less asthma educational sources ($p < .001$) and sources of education was the determining factor of self-management ($p < .016$), but they did not mention health education experiences or needs in the interview data. Although there were few resources for counseling about child's disease, some parents showed motivation to participate in educational activities, if we would provide an asthma education program. Parents in Taoyuan with significantly lower SES also complained that facilities for asthma control were expensive. Usually, the use of health care resources and health behaviors has been thought of as a "personal responsibility," until medical sociologists changed it into a "social responsibility". "Blaming victims" was not a factor that was taken into consideration when planning health education programs (Minkler, 1999). Liberators, Link, and Kelsey (1988) reviewed 76 epidemiological studies and found that 32% indicated social class as a risk factor of health. Parents in the Taoyuan area demonstrated less knowledge about asthma care that was caused by fewer opportunities for health education. The different health education sources were not personal factors. These are all considered to be social factors of self-management behaviors. FitzGerald (1994) reported that SES was one of the barriers to attending asthma clinics and asthma education programs. National Health Insurance for people in Taiwan was established in 1995. However, the issue of unequal allocation of health care resources indicates that health inequity still arises from socioeconomic inequity. Balancing health care resources, providing health education, and protecting people of low SES are future directions for this phenomenon.

Perception of the effectiveness of caring for an asthmatic child could affect the self-management behaviors of parents living in the Taoyuan area. Parents will continue self-management behaviors, if they feel that these behaviors can help their children. The quantitative data showed no significant differences between two groups, but from interview some parents in Taoyuan doubted the effectiveness of the asthma management. Perceived

effectiveness was the significant determining factor of self-management. Devising evidence-based education programs to reinforce the effects of various asthma control will be a major topic.

The quantitative and qualitative data revealed that parents in the Taoyuan area have poorer self-management behaviors, lack the ability to manage asthma exacerbation, and are more dependent on doctors. The appropriate health education to correct their misunderstanding and poor management behaviors is important. Noncompliance with medications is one of the worst self-management behaviors, including self-adjustment of dosages and improper use of inhalers. Parents in the Taoyuan area frequently described how they could not managed the asthma attack and their dependence on emergency care or hospital treatment. They were more dependent on professionals and hospitals than on their own management. Qualitative data also showed that some parents solely depended on health care professionals for dealing with asthma attacks. This causes an extra burden on the already over burdened health care system. Wasilewski et al., (1996) indicated that most emergency care does not really deal with severe asthma attacks; what clients needed was home care. Parents who live in the Taoyuan area are far more likely to seek alternative treatments for asthma, sending children to different treatment clinics for alternatives. They like to use herbal medicine, which is the same behaviors described by Lim, Goh, Tan, and Lee (1996). Most people in Asia believe in the effectiveness of herbal medicine as an asthma treatment. Little health information and difficulty in assessing health resources were common problems in the Taoyuan area and may have induced these tendencies to use folk medicine to treat illness. Lack of use of peak flow meter did not differ between two areas. Parents complained that it was too complex to use PEF everyday. They would forget to use it monitor asthma signs/symptoms unless the asthma was exacerbated.

On the basis of the PRECEDE-PROCEED model, the educational needs assessment and diagnosis could be considered more comprehensively. The amount of variance explained by the independent variables in three regression models ranged from 53.0% to 64.5%, a value that was higher than the 25% variance found in Mesters, Meertens, Kok, and Parcel (1994). Qualitative data from patients can be interpreted as reflecting the subjective meaning and theories ascribed to interaction with health care providers. These data reveal how the dimension

under study is shaped by cultural and social factors (Foss & Ellefsen, 2002). The present study obtained qualitative data that complemented our interpretation of the quantitative results precisely and provided information about lack of knowledge of asthma, lack of confidence and barriers experienced by parents from the Taoyuan area.

Some researchers have argued that qualitative evidence is only used to produce hypotheses that then are tested quantitatively and that qualitative studies are used to produce typologies that improve the understanding of factors explored through qualitative evidence (Bullock, Little, & Millham, 1992). The combined quantitative and qualitative methods of the present research not only explored the different self-management behaviors of two populations but also provide a deeper, more multifaceted insight, and transcend the view of surface results (Foss & Ellefsen, 2002). This approach could provide guidelines for developing more specific educational programs and help different groups of parents meet their educational needs in the context of various socioeconomic backgrounds. In order to differentiate the educational problems of parents with asthmatic children from different areas, our results provide new thinking that effective self-management behaviors could be reinforced by emphasizing significant determinants. More studies on educational intervention are needed, especially for minority parents who have low SES and low family income.

Conclusions

This research used the PRECEDE-PROCEED model to determine data from two different target populations. Our results indicated that parents with asthmatic children who live in different areas have different problems in their self-management of asthma care. All of these differences may be caused by differences in SES. Parents with low SES have less knowledge about asthma, fewer facilities for controlling the asthma, less educational sources, and worse self-management behaviors. The interview data echoed some of these different experiences. More research is needed to explore the relationship between socioeconomic factors and self-management behaviors in parents living in different areas. Self-efficacy and perceived effectiveness were also significant determinants of self-management behaviors. Specific health education programs could be developed on the basis of these educational diagnosis findings.

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運用量性與質性研究方法比較兩所醫院 氣喘兒童父母之自我處理行為

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摘要：本研究目的為比較北台灣兩所醫院氣喘兒童父母自我處理行為之差異，以及藉由訪談探索自我處理行為之障礙，227 位氣喘兒童父母，其中 94 位是台北地區；133 位是桃園地區，完成自填結構式問卷。並訪談其中 16 位氣喘兒童父母。結果顯示桃園的氣喘兒童父母之年紀較輕、社經地位較低、其氣喘孩子的運動限制較多；而且其氣喘知識、始能因素以及自我處理行為皆較台北的氣喘兒童父母為差，以多元迴歸分析發現社經地位、自我效能、教育獲得、以及自覺處理效果是全部 227 位父母自我處理行為之顯著預測因子 (Adjusted $R^2 = .593$)。此外，訪談資料在影響氣喘兒童父母之自我處理之因素上，歸納出六項主題之內容為：不瞭解及討厭氣喘標籤、缺乏嚴重度認知、對氣喘藥物缺乏了解、對環境控制缺乏信心、防蟻用具的經濟負擔、懷疑處理效果。而自我處理行為的三項主要障礙為：不一致的使用另類治療、過度依賴醫療服務、以及缺乏使用尖峰呼氣流速計。居住桃園地區的氣喘兒童父母自我處理行為較差，社經地位為其中的一個重要因素，健康信念亦存在許多誤解，藉由質量整合教育需求評估研究提供豐富的資訊，可以設計適合特定群體的教育內容。

關鍵詞：氣喘、父母、自我處理。

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受文日期：93 年 11 月 4 日 修改日期：94 年 2 月 18 日 接受刊載：94 年 3 月 4 日

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