

Development of the Women's Health Empowerment Scale (WHES) for Thai female factory workers

จิรเนาวิ ทศศรี¹
อรัญญา ชาวลิต²
อุมาพร ปุญญโสพรรณ³
Linda Bullock⁴

Abstract:

Development of the Women's Health Empowerment Scale (WHES) for Thai female factory workers

Thassri J, Chaowalit A, Boonyasopun U, Bullock L.

Department of Obstetric-Gynaecologic Nursing and Midwifery, Department of Medical Nursing,

Department of Public Health Nursing, Faculty of Nursing,

Prince of Songkla University, Hat Yai, Songkhla, 90112, Thailand

University of Missouri, Columbia, Missouri, USA.

E-mail: jeranoun.t@psu.ac.th

Songkla Med J 2006;24(1):9-17

Objective: *To develop an instrument for assessing empowerment related to women's health regarding Thai female factory workers.*

Design, materials and methods: *Qualitative and quantitative methods were employed in combination with literature reviews to*

¹M.Ed. (Higher Education), Assoc. Prof., Department of Obstetric-Gynaecologic Nursing and Midwifery ²Ph.D. (Nursing), Assoc. Prof., Department of Medical Nursing ³Ph.D. (Nursing), Lecturer, Department of Public Health Nursing, Faculty of Nursing, Prince of Songkla University, Hat Yai, Songkhla, 90112, Thailand ⁴Ph.D., RN, FAAN, University of Missouri, Columbia, Missouri, USA.
รับต้นฉบับวันที่ 7 มิถุนายน 2548 รับลงตีพิมพ์วันที่ 24 กุมภาพันธ์ 2549

develop the items on a women's health empowerment scale (WHES). The subjects were 1,384 women who were working in manufacturing factories in southern Thailand at the time of the study.

Results: Using exploratory factor analysis with the entire sample and by splitting the whole group into two sub-samples, the resulting four factors of the WHES included: (1) Assurance to control action of personal well-being (20 items), (2) The ability to influence reciprocal community support in solving health problems (15 items), (3) Actions to achieve visions and goals of health (9 items), and (4) Increasing a sense of self-awareness to become and remain healthy (15 items). There were significant correlations between the demographic variables (age, personal income, educational level, type of family, and caregivers) and the WHES. To achieve consistency in measurement, the WHES was tested for reliability. Cronbach's coefficient alpha of the four factors and the total scale ranged from 0.81-0.96 indicating a highly reliable internal consistency, and test-retest reliability showed significant correlation ($r = 0.72, p < .001$).

Conclusions: The WHES is a reliable and valid measure for assessing empowerment related to women's health in Thai female factory workers and other similar factory contexts such as factories operating in the agricultural and mineral industries.

Key words: Women Health Empowerment Scale (WHES), female factory workers

บทคัดย่อ:

วัตถุประสงค์เพื่อสร้างเครื่องมือวัดการเสริมสร้างพลังอำนาจเกี่ยวกับสุขภาพของผู้หญิงไทยที่ทำงานในโรงงาน เริ่มจากทบทวนวรรณกรรมและสัมภาษณ์คนงานผู้หญิงในโรงงานจำนวน 12 คน นำผลที่ได้มาสร้างแบบสอบถามใช้กับกลุ่มตัวอย่าง 1,384 คน ผลพบว่าเครื่องมือวัดการเสริมสร้างพลังอำนาจเกี่ยวกับสุขภาพของผู้หญิงไทยที่ทำงานในโรงงานมี 59 ข้อ แบ่งเป็น 4 องค์ประกอบ คือ ความมั่นใจในตัวเองที่จะดูแลสุขภาพให้ดี (20 ข้อ) ความสามารถที่จะพึ่งพากันเพื่อสุขภาพที่ดี (15 ข้อ) การลงมือทำเพื่อให้สำเร็จลุล่วงตามเป้าหมายของสุขภาพที่ดี (9 ข้อ) และการตระหนักรู้เพื่อสุขภาพที่ดี (15 ข้อ) คุณภาพเครื่องมือได้จากการวิเคราะห์องค์ประกอบทั้งกลุ่มและแบ่งครึ่งกลุ่มตัวอย่าง พบว่าโครงสร้างมีความสอดคล้องกัน เมื่อตรวจสอบความตรงเชิงโครงสร้างของเครื่องมือกับข้อมูลส่วนบุคคล พบว่ามีความสัมพันธ์กันอย่างมีนัยสำคัญทางสถิติในเรื่องอายุ รายได้ส่วนตัว ระดับการศึกษา ชนิดของครอบครัว และผู้ดูแลเมื่อเจ็บป่วย ส่วนความเที่ยงขององค์ประกอบและภาพรวมของเครื่องมือมีค่าอยู่ในระดับสูง ($\alpha = 0.81-0.96$) และมีความเที่ยงเมื่อทดสอบซ้ำอย่างมีนัยสำคัญทางสถิติ ($r = 0.72, p < .001$) กล่าวโดยสรุป เครื่องมือที่สร้างมีคุณภาพและสามารถนำใช้วัดการเสริมสร้างพลังอำนาจของผู้หญิงที่ทำงานในโรงงานได้

คำสำคัญ: เครื่องมือวัดการเสริมสร้างพลังอำนาจเกี่ยวกับสุขภาพของผู้หญิง, ผู้หญิงที่ทำงานในโรงงาน

Introduction

All across the world, health care for men and women remains unequal. At present, women represent half of the world's population.¹ Therefore, without considering women's health to be a serious issue is a defeat from the start. In Thailand women represent more than 50 percent of the population, in addition more than half of the women in Thailand who are aged 15 or above and are in employment, are below primary school level of education (65.65 percent).² Low

education and economic pressures have forced many Thai women to seek work in factories, indeed 55% of all employed Thai women are now working in the manufacturing industry. Many of these women tend to have numerous health problems, which are often a result of a lack of health promotion, health maintenance and health awareness.

In order to improve health for women across the world, women need to become active and align themselves to become a powerful force for change. Responsibility, independence,

cooperative interactions and mutual respect for one another's individuality, and an involvement in health care, is vital. If women feel inactive, irresponsible and dependent, and have no involvement or power over their health behavior, it is very difficult for them to gain control of their health. Therefore, empowerment is a significant concept that is being applied to a wide variety of women's health covering physical, psychological, spiritual, and social aspects. It is also important to note that empowerment tends to increase with higher education and is related to annual income, both of which are at a low level for the subjects of the WHES.³⁻⁴

Empowerment is an acceptable concept that can be used to increase the levels of power and influence for oppressed groups such as women with a low level of education working in factories. Using the empowerment concept for female workers in factories, health improvement and maintenance will occur and health problems can be reduced in the future. Previous studies support the view that for various groups such as AIDS patients, rheumatoid arthritis sufferers, mothers of chronically ill children, and employees in companies, empowerment is an effective concept that can be used to solve the problems encountered by these groups and is the most important principle of total quality management.⁵⁻⁸ For women in factories, no empowerment scale existed to adequately assess levels of empowerment and a tool was needed to provide an effective and efficient approach. The main purpose of this study was to develop a reliable and valid instrument that can assess the extent of empowerment for Thai female factory workers as related to the maintenance and enhancement of well-being, and reducing the risk of developing diseases. Assessing the extent of empowerment will enable greater identification of women's health problems and lead to strategies for improving and maintaining an optimal level of women's health in factories.

Materials and methods

To develop the empowerment scale in this study, qualitative and quantitative methods were employed. For the qualitative study, a convenience sample of subjects in six manu-

facturing factories in region 12 of Songkhla province was obtained. The quantitative study was divided into two parts using different techniques. The first step of the sampling technique was purposive sampling. The two regions, namely region 11 and region 12, that had the highest number of female workers in manufacturing factories in Nakhon Sri Thammarat and Songkhla were selected. Then, proportional sampling technique was used to identify factories and female workers from Nakhon Sri Thammarat and Songkhla province. In Nakhon Sri thammarat province, 162 subjects were randomly selected from three factories, and in Songkhla province, 1,222 subjects were randomly selected from a total of 7 factories. The criteria for choosing the recruiting factories was to randomly select subjects from factories based on the number of employees in the factories, therefore the factories were grouped according to the following classification: (1) 100-299 employees, (2) 300-499 employees, (3) 500-999 employees, and (4) 1,000 or more employees. The criteria for recruiting subjects were their ability to communicate and read Thai language, and their working in a manufacturing factory at the time of the study. For a sample size, a ratio of at least 10 subjects for each item is desirable to generalize from the sample to a wider population.⁹

Development of an instrument and psychometric evaluation

The Women Health Empowerment Scale (WHES) was developed by the researcher using a two-phase process as follows: (Figure 1).

Phase 1: Qualitative study was divided into two stages. In the first stage of the qualitative study, 8 women were in-depth interviewed to gain an overview of the empowerment concept regarding health of Thai women in factories and to check the feasibility of the interview process. Then, a five-expert committee reviewed the in-depth interview. In the second stage of the qualitative study 12 women were individually in-depth interviewed to develop themes for the item pools of the second phase, namely the quantitative study.

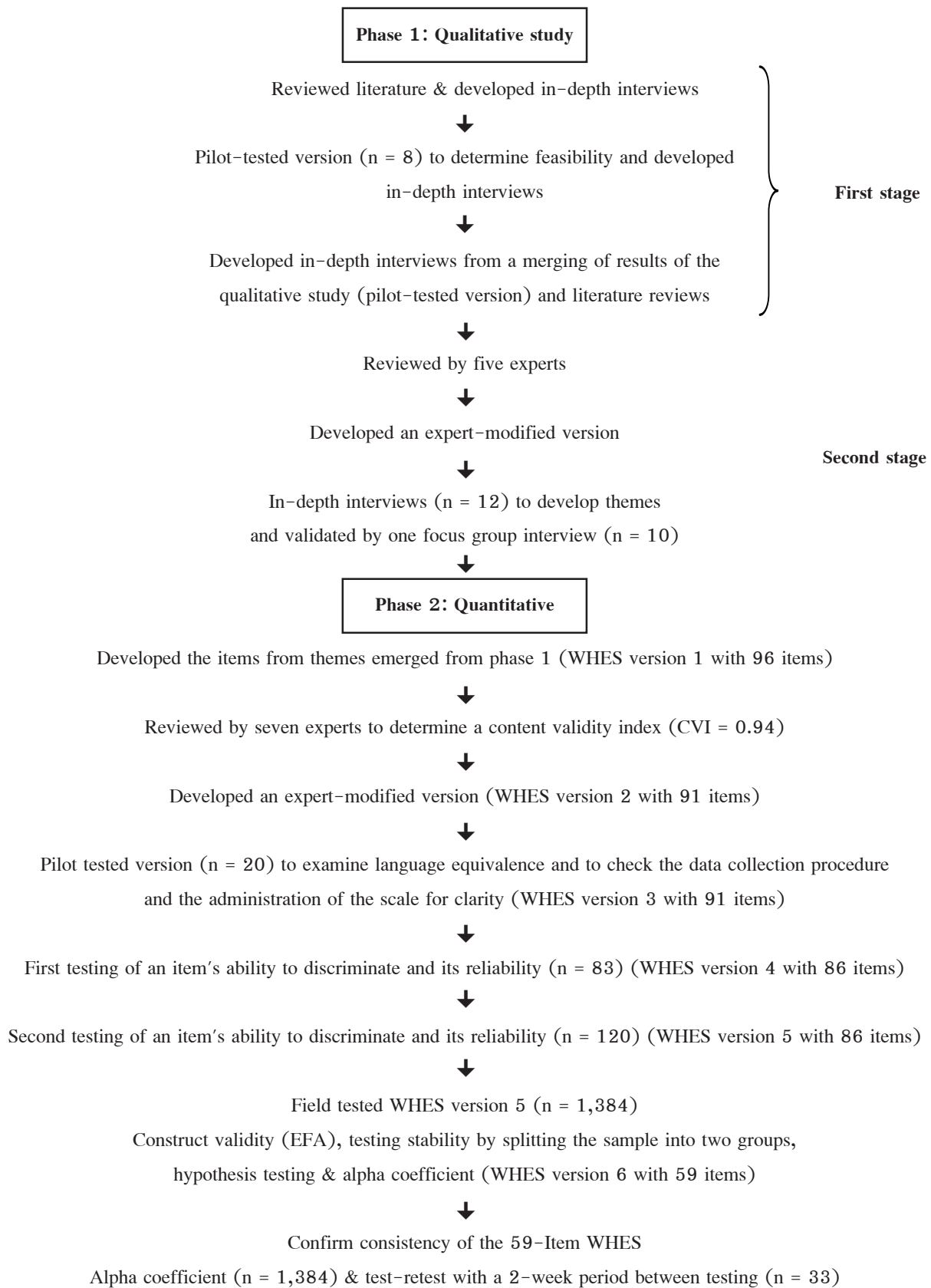


Figure 1 The development and evaluation of the psychometric properties of the WHES

Phase 2: Quantitative study. This phase was concerned with using the guidelines of DeVellis¹⁰ (1991) to develop the WHES for Thai female workers in factories. It consisted of (1) an initial items pool from phase 1; the WHES version 1 consisted of 96 items, (2) the committee-modified version; a seven-expert committee reviewed the WHES version 1 (the WHES version 2 with 91 items), (3) modification of the pilot tested version; the WHES version 2 was pilot-tested with 20 female factory workers; (the WHES version 3 with 91 items), (4) the first testing with 83 female factory workers for assessing the items' ability to discriminate and reliability (the WHES version 4 with 86 items), (5) the second testing with 120 female factory workers to obtain the items' ability to discriminate and reliability (the WHES version 5 with 86 items), and (6) the field-test version with 1,384 women in the selected factories (the WHES version 6 with 59 items).

Data collection

Prior to data collection, each factory in the study was sent a letter seeking permission to carry out data collection from their workers. After permission was granted, the data were collected from May 2004 to January 2005. The time periods of data collection from each phase were as follows: (1) phase 1: Qualitative study; first stage was conducted from May to June 2004 and the second stage was conducted from August to October 2004, and (2) phase 2: Quantitative study was conducted from November 2004 to January 2005.

Data Analysis

Only surveys with complete data were included in the analysis. Demographic data were analysed to give descriptive statistics. Data analysis of the empowerment scale was divided into two phases; qualitative and quantitative data analysis.

Phase 1: Qualitative data analysis. In establishing the trustworthiness of the scale development, first, triangulation techniques, individual in-depth interview and focus group interview, were used. This step was to determine the validity of the interview data. Participants were asked to confirm, reflect, clarify and access the substantive content of verbally expressed views, opinions, experiences and attitudes. From

the interviews, themes for the scale development emerged through using content analysis.¹¹

Phase 2: Quantitative data analysis. To assure validity and reliability of the WHES, first, content validity index (CVI) was used to assess the relevancy of the items to the content and identify clarity and conciseness of items.¹² The resulting CVI from the seven-expert committee in this step was 0.94. Then, discrimination index and reliability were used to test the quality of the WHES in the first and second testing. The discrimination index¹³ and reliability were assessed using t-test and Cronbach's alpha coefficient respectively. Then, exploratory factor analysis was applied to the empowerment scale to identify the components of WHES. Testing stability of the factors was conducted by splitting the sample into two samples. For hypothesis testing, Pearson product-moment correlations were used to compose the demographic variables of the nominal scale (age, personal income, family income, and number of family member) and the resulting factors of the WHES, while correlation ratio (eta) was used to compose the demographic variables of the interval scale (educational level, type of family, and caregivers) and the resulting factors of the WHES. To analyze reliability, Cronbach's alpha coefficient was used to determine the reliability of the individual subscales and the total scale. Moreover, test-retest was used with 33 subjects to establish the consistency of the WHES.¹⁴

Results

Sample characteristics and the components of the WHES with its psychometric properties in the last step of scale development are presented. A high percentage of the women factory workers were Buddhist (64.9%), married (56%), and had a low education level (less than primary school = 46.5%). For the components of the WHES, the four factors and corresponding 59 items had factor loadings ranging from 0.41-0.71 and displayed a total of 39.3% of variance. The resulting four factors included: Factor I: Assurance to control action of personal well-being with factor loadings ranging from 0.41-0.64 and displayed a total of 28.1% of variance with an eigenvalue of 24.13 (20 items), Factor II: The ability to influence

a reciprocal community support in solving health problems with factor loadings ranging from 0.41–0.70 and displayed a total of 5.4% of variance with an eigenvalue of 4.63 (15 items), Factor III: Actions to achieve visions and goals of health with factor loadings ranging from 0.42–0.69 and displayed a total of 3.3% of variance with an eigenvalue of 2.87 (9 items), and Factor IV: Increasing a sense of self-awareness to become and remain healthy with factor loadings ranging from 0.41–0.71 and displayed a total of 2.5% of variance with an eigenvalue of 2.15 (15 items). For the validity and reliability of the WHES, after conducting the construct validity of the WHES on the entire sample ($n = 1,384$), the stability was then tested by splitting the sample into two groups ($n = 692$) and the WHES scores were compared. The results of these two techniques showed similar items in each factor, factor loadings, percent of variance, eigenvalue and communalities. In addition, the demographic variables and the resulting four factors of the WHES were tested for hypothesis testing. The results showed there were significant correlations for most of the demographic variables and the WHES total score including age, educational level, personal income, type of family, and caregivers. To measure consistency, the WHES was tested using various methods of reliability. First, Cronbach's alpha coefficient was computed on the original 86-Item WHES total score. The result showed a satisfactory reliability of 0.9675. Then, using the same method of Cronbach's alpha coefficient, the final version of the WHES (59-Item WHES) was tested. The highly reliable internal consistency of the four factors and the total scale of the 59-Item WHES ranged from 0.8106–0.9555. Finally, test-retest reliability showed significant correlation ($r = 0.723$, $p < .001$), indicating the WHES could be used to apply with consistency in a time period such as a 2-week period.

Discussion

Although some measures of empowerment have been developed,¹⁴⁻¹⁷ they are not the same as the WHES. The WHES focuses on an individual level of empowerment regarding women's health of female factory workers that at

this time is nonexistent. The discussion of the findings is presented in two parts; the components of the Women Health Empowerment Scale and its psychometric properties. First, the components of the WHES consisted of four factors that have some subscales similar to the previous studies such as "power" from the empowerment scale of an outpatient mental health population,¹⁸ "self-esteem-self-efficacy" from the empowerment scale of consumers of mental health services,⁴ and "system advocacy" of the families whose children had serious emotional disturbance.¹⁹ The main reasons to explain the four components of empowerment scale in this study were: (1) empowerment influences the individual's feelings of competence and control.²⁰⁻²² An example of a WHES item in Factor I was, "I feel confident when solving the problems of life". Therefore the first component of the WHES was "Assurance to control action of personal well-being", (2) empowerment does not occur to the individual alone, it needs to connect with other people.^{3, 23} An example of a WHES item in Factor II was, "I participate in activities with my friends to reduce tension". Therefore the second component of the WHES was "The ability to influence reciprocal community support in solving health problems", (3) a major component of empowerment is action.^{21, 24-25} Therefore, the third component of the WHES was "Actions to achieve visions and goals of health". An example of a WHES item in Factor III was, "I work hard to have an excellent future", and (4) it would be difficult for people to gain control over self if without self-awareness.²⁶ Therefore, the fourth component of the WHES was "Increasing a sense of self-awareness to become and remain healthy". An example of a WHES item in Factor IV was, "I believe that eating a healthy diet will keep the body healthy". Secondly, the reasons for the WHES's psychometric properties were as follows: (1) The process of developing the WHES consisted of various techniques Berg¹¹ recommended that researchers be instructed in the use of research strategies composed of multiple methods in a single investigation. (2) The WHES has a sufficient pool of items. As the length of the scale is increased, the chance of errors of measurement more or less cancel out; the score comes to depend more and more upon the characteristics of the person being measured; and a more

accurate appraisal of the person is obtained.²⁷ (3) The items of the WHES were written in the five-point Likert scale format that is appropriate to measure the construct of empowerment.^{17, 21-22} (4) The language and the content of the WHES are derived from the reality of the samples. One woman in this study said "the contents of the questionnaire occurred in real life". Another woman said, "the contents are the same as me". (5) Several content experts reviewed the WHES: a committee of five experts in the qualitative study were used to review the in-depth interview and a seven-expert committee in the quantitative study were used to determine the content validity index. Morton²⁸ referred to experts as sources of certainty and many people accept experts opinions without question. (6) The size of the sample in this study (n = 1,384) was large enough to reduce the standard error of measurement to negligible proportions, and (7) the high response rate of 85.35 percent in this study provided the generalization of the findings.¹⁸

The creation of the WHES involved both science and art, furthermore the developmental process of the WHES in this study built in validity and reliability from the very beginning until completing the scale. The WHES had high internal consistency, and the analysis produced a satisfactory four-factor solution. Thus, the WHES is a valuable tool that can be used to apply to all women who work in factories with similar contexts such as agricultural and mineral factories.

Conclusions

The Women Health Empowerment Scale in this study consisted of four components with 59 items, moreover it reflected the situation in a Thai context as follows: (1) feelings to take action to be healthy, such as feeling happy, feeling delighted, feeling content, and feeling proud (Factor I: Assurance to control action of personal well-being, 20 items), (2) influencing a reciprocal community support to bring about change in each situation to maintain a balance in life, such as friends and supervisors (Factor II: The ability to influence a reciprocal community support in solving health problems, 15 items), (3) believing and perceiving over self

and environment to be healthy (Factor III: Increasing a sense of self-awareness to become and remain healthy, 9 items), and (4) exercising to meet one's own standards, expectations and goals (Factor IV: Actions to achieve visions and goals of health, 15 items). The WHES has been tested for various types of validity and reliability, therefore it is a valuable tool for health care providers to advocate in other studies.

Acknowledgements

The studies reported in this paper are partly based on the author's doctoral research. I would like to express my sincere gratitude to the many people who provided extraordinary support and guidance during my dissertation process and doctoral study. I am indebted to the specialists, all the women in the factories and the factory managers whose kind cooperation and assistance ensured a successful conclusion to the study. Furthermore, I would like to convey my appreciation to the Royal Thai Government for their scholarship support throughout my program.

References

1. Kablisingh C. Present situation of women in Buddhism. In: Somswasdi V, Theobald S, editors. Women, gender relations and development in Thai society. Chiang Mai: Ming Muang Navarat Co., Ltd; 1997;257-5.
2. National Statistical Office. Statistical table of the changing working survey in provinces: first trimester (January-March, 2002). Bangkok: National Statistical Office; 2002.
3. Edwards JL, Green KE, Lyons CA. Personal empowerment, efficacy, and environmental characteristics. *J Educ Administ* 2002;40:67-86.
4. Rogers ES, Chamberlin J, Ellison AL, Crean T. A consumer-constructed scale to measure empowerment among users of mental health services. *Psychiatric Services* 1997;48:1042-7.
5. Somruck K. Empowering experiences of family caregivers in caring for AIDS patients at home [dissertation]. Chiangmai: University of Chiangmai; 2002.

6. Janejob P. Empowerment in patient with rheumatoid arthritis [dissertation]. Chiangmai: University of Chiangmai; 1999.
7. Gibson CH. The process of empowerment in mothers of chronically ill children. *J Adv Nurs* 1995;21:1201-10.
8. Ugboro IO, Obeng K. Top management leadership, employee empowerment, job satisfaction, and customer satisfaction in TQM organizations: an empirical study. *J Qual Manag* 2000;5:247-72.
9. Munro BH. Statistical methods for health care research. 4th ed. Philadelphia: Lippincott; 2001.
10. DeVellis RF. Scale development: theory and applications. London: Sage; 1991.
11. Berg BL. Qualitative research methods for the social sciences. 4th ed. Boston: Allyn and Bacon; 2001.
12. Waltz CF, Strickland OL, Lenz ER. Measurement in nursing research. 2nd ed. Philadelphia: F.A. Davis; 1991.
13. Sri-Sa-Ard B. Discrimination analysis. Measurement of education 1989;11:39-45.
14. Shiu ATY, Wong RYM, Thompson DR. Development of a reliable and valid Chinese version of the diabetes empowerment scale. *Diabetes Care* 2003;26:2817-21.
15. Bolton B, Brookings J. Development of a measure of intrapersonal empowerment. *Rehabilitation Psychology* 1998;43:131-42.
16. Anderson RM, Funnell MM, Fitzgerald JT, Marrero DG. The Diabetes Empowerment Scale: a measure of psychological self-efficacy. *Diabetes Care* 2000;23:739-43.
17. Faulkner M. A measure of patient empowerment in hospital environments catering for older people. *J Adv Nurs* 2001;34:676-86.
18. Wowra SA, McCarter R. Validation of the empowerment scale with an outpatient mental health population. *Psychiatric Services* 1999;50:959-61.
19. Singh NN, Curtis WJ. Psychometric analysis of the family empowerment scale. *J Emotion Behav Disord* 1995;3:85-91.
20. Akey TM, Marquis JG, Ross ME. Validation of scores on the psychological empowerment scale: a measure of empowerment for parents of children with a disability. *Educational and Psychological Measurement* 2000;60:419-38.
21. Chamberlin J. A working definition of empowerment. *Psychiatr Rehabil J* 1997;20:43-6.
22. Zimmerman MA, Warschausky S. Empowerment theory for rehabilitation research: conceptual and methodological issues. *Rehabilitation Psychology* 1998;43:3-16.
23. Eugenie H. The health effects of work-based welfare. *J Nurs Scholarsh* 2002;34:363-8.
24. Finfgeld DL. Empowerment of individuals with enduring mental health problems: results from concept analyses and qualitative investigations. *Adv Nurs Sci* 2004;27:44-52.
25. Cox EO, Parsons RJ. Empowerment-oriented social work practice with the elderly. California: Wadsworth, Inc; 1994.
26. Silvia PJ, O'Brien ME. Self-awareness and constructive functioning: revisiting "The human dilemma". *J Soc Clin Psych* 2004;23:475-89.
27. Thorndike RL, Hagen EP. Measurement and evaluation in psychology and education. 4th ed. New York: John Wiley & Sons; 1977.
28. Morton A. Philosophy in practice: an introduction to the main questions. Cambridge, Massachusetts: Blackwell Publishers Inc; 1996.

Appendix

Items, factor loadings, percent of variance, eigenvalue, and communalities of the four factors of the WHES (N = 1,384)

Items (n = 20)	Factor loadings	Communalities
Factor I:		
Assurance to control action of personal well-being (% of variance = 28.06, Eigenvalue = 24.13)		
Examples:		
WHES71 After conflict with my supervisor, I feel happy that I can come to a place of understanding with my supervisor.	.64	.46
WHES70 After having problems with colleagues, I feel happy that I can come to understanding with them.	.61	.45
WHES73 If discouraged in life, I feel delighted that I can make changes for the better.	.59	.45
Factor II:		
The ability to influence a reciprocal community support in solving health problems (% of variance = 5.38, Eigenvalue = 4.63)		
Examples:		
WHES30 I invite my friends to participate in activities for their mental happiness.	.70	.58
WHES31 I participate in activities with my friends to reduce tension.	.61	.49
WHES29 I invite my close friends to participate in recreational activities.	.59	.49
Factor III:		
Actions to achieve visions and goals of health (% of variance = 3.34, Eigenvalue = 2.87)		
Examples:		
WHES12 When I have goals in life, I try as best as I can to reach them.	.69	.50
WHES11 I work hard to have an excellent future.	.61	.40
WHES13 When I do not reach my goal, I do not reduce my effort to do it the next time.	.60	.38
Factor IV:		
Increasing a sense of self-awareness to become and remain healthy (% of variance = 2.50, Eigenvalue = 2.15)		
Examples:		
WHES55 I believe that to follow a religious life will often bring happiness.	.71	.55
WHES43 I believe that eating a healthy diet will keep the body healthy.	.63	.44
WHES56 I am confident by acting in a good way, life will be happy.	.60	.50