

CHAPTER 4

RESULTS AND DISCUSSION

Introduction

The main purpose of this study was to develop Women's Health Empowerment Scale (WHES) for Thai female factory workers and determine its psychometric properties. This chapter consists of the results of the study and the discussion of those results. The results of this study are presented as follows: (1) characteristics of the sample, (2) analysis of the research question: What are the components of the WHES? and (3) analysis of the research question: How is the validity and reliability of the WHES.? The discussion of the results is presented in two parts: (1) the components of the WHES and (2) the psychometric properties of the WHES.

Results

1. Characteristics of the sample

Of the 1,700 surveys distributed by the researcher and research assistants, 1,451 were returned (85.35%). Of this number, 67 (4.62%) surveys were incomplete, leaving 1,384 (81.41%) completed surveys for the study sample. Table 5 describes the personal characteristics of the subjects. Almost all female factory workers were Buddhist (64.9%). Religion was very important for the subjects in this study (51.8%). The majority, 775, were married (56%), and their educational level less than primary school leavers (46.5%). Most reported an adequate income but there was nothing left to save 758 (54.8%). 1,091 of the women had their own homes (78.8%). The family

type was extended family (86%), with relatives of the majority of subjects, 1,181, acting as caregivers when necessary (85.3%).

Table 5

Demographic Characteristics of Thai Female Factory Workers (N = 1,384)

| Personal characteristics | | Frequency | Percentage |
|--------------------------|-----------------------|-----------|------------|
| Religion | Buddhist | 898 | 64.9 |
| | Muslim | 482 | 34.8 |
| | Christian | 4 | 0.3 |
| Importance of religion | Very important | 717 | 51.8 |
| | Fairly important | 581 | 42.0 |
| | Fairly unimportant | 80 | 5.8 |
| | Unimportant | 6 | 0.4 |
| Marital status | Single | 500 | 36.1 |
| | Married & together | 735 | 53.1 |
| | Married & separated | 40 | 2.9 |
| | Widowed | 79 | 5.7 |
| | Divorced | 30 | 2.2 |
| Educational level | None | 26 | 1.9 |
| | Primary school | 617 | 44.6 |
| | Secondary school | 502 | 36.3 |
| | Vocational level | 81 | 5.9 |
| | High vocational level | 91 | 6.6 |
| | Bachelor degree | 67 | 4.8 |
| Level of income | Adequate & save | 334 | 24.1 |
| | Adequate & not save | 758 | 54.8 |
| | Adequate but has debt | 183 | 13.2 |
| | Inadequate & has debt | 109 | 7.9 |
| House ownership | Myself & not renting | 1,091 | 78.8 |
| | Others & not renting | 94 | 6.8 |
| | Paying rent | 199 | 14.4 |

Table 5 (continued)

| Personal characteristics | | Frequency | Percentage |
|---|-----------------|-----------|------------|
| Type of family | Nuclear family | 146 | 10.5 |
| | Extended family | 1190 | 86.0 |
| | With friends | 36 | 2.6 |
| | Alone | 12 | 0.9 |
| Person to take care of when ill (Caregivers) | Relatives | 1,181 | 85.3 |
| | Friends | 112 | 8.1 |
| | Supervisors | 18 | 1.3 |
| | Combination | 15 | 1.1 |
| | None | 58 | 4.2 |

As shown in Table 6, the female factory subjects ranged in age from 14 to 56 years old with an average age of 29.86 years (SD = 8.16). They had a household income ranging from 3,000 – 50,000 Baht or US. \$ 75 - \$ 1,250 per month (currency exchange rate estimate \$1 = 40 Baht at Jan/27/05). Participants' average number of years working in a factory was 5.54 (SD = 10.51).

Table 6

Means, Standard Deviations, Minimum, and Maximum Scores for Continuous Demographic Variables (N = 1,384)

| Variables | N | M | SD | Min | Max |
|--------------------------|-------|----------|----------|--------|--------|
| Age | 1,384 | 29.86 | 8.16 | 14 | 56 |
| Age when married | 884 | 21.69 | 3.94 | 14 | 38 |
| Personal income | 1,384 | 4,484.56 | 1,619.41 | 2,000 | 20,000 |
| Family income | 1,384 | 7,220.16 | 4,043.34 | 3,000 | 50,000 |
| Number of family members | 1,384 | 4.77 | 1.88 | 1 | 12 |
| Years in factory | 1,384 | 5.54 | 10.51 | < 1 Mo | 22.05 |

2. Analysis of the research question: What are the components of the WHES?

The research question was answered by subjecting the 86-item WHES to principal component analysis. For analyzing and interpreting the factor analysis, four criteria were set including: (1) the factors with Eigenvalues greater than 1, (2) the Scree Plot, (3) an item loading cutoff point of at least .40, and (4) theoretical congruence in each factor. Examination of the initial solution yielded 16 factors with eigenvalue greater than 1. An examination of the Scree plot (Figure 5) indicated that 3, 4, and 5 factors should be examined. From the qualitative phase, WHES was hypothesized to have 4 underlying dimensions; a 4-factor solution using varimax and oblique rotations was originally specified. Finally, the 4-factor oblique solution was judged to be the most parsimonious and theoretically interpretable.

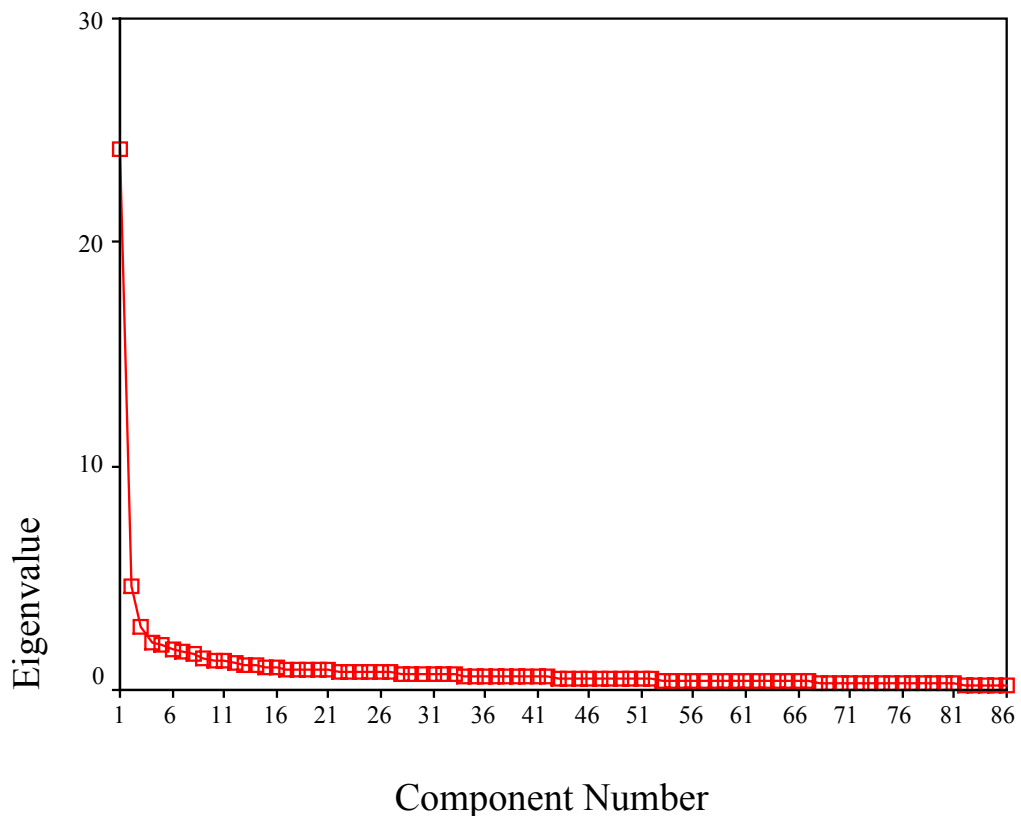


Figure 5. Scree Plot for Factor Analysis

Note. Break in Size of Eigenvalues Occurs between the Fourth and the Fifth Factors

The four factors consisted of 59 items and displayed a total of 39.276% of variance. The resulting four factors included: (1) Assurance to control action of personal well-being, (2) The ability to influence a reciprocal community support in solving health problems, (3) Actions to achieve visions and goals of health, and (4) Increasing a sense of self-awareness to become and remain healthy.

Factor 1 consisted of 20 items with factor loadings ranging from 0.405-0.635, and accounted for 28.058% of variance with an eigenvalue of 24.130. An examination of the item content, as shown in Table 7, revealed that these items focused on assurance of well-being. These consisted of feelings and believe including: (1) feelings of happiness, delight, confidence, contentment, and pride to control action of well-being (19 items), and (2) belief to control action of well-being (1 item), which was comparable to the hypothesized underlying subscale of the 86-item WHES. Thus this factor was labeled as “Assurance to control action of personal well-being.”

Factor 2 consisted of 15 items with factor loadings ranging from 0.405-0.698, which accounted for 5.384% of variance with an eigenvalue of 4.630. An examination of the item contents, as shown in Table 8, revealed that these items focused on participation in healthy activities with others such as friends, and supervisors (14 items), which were comparable to the hypothesized underlying subscale of the 86-item WHES. There was only one item (WHES 1: I have ways to make myself healthy) in this factor that did not mentioned participation in activities with others. However, the meaning in this item also included participation with others. Therefore, this item (WHES 1) was considered in Factor II. In addition, one item in this factor (WHES 35: I invite my close friends to participate in cultural activities for life happiness) had a primary loading (.475) in Factor II and a side

loading (.405) in Factor IV. This item was included into two factors and it was not significantly different. When considering the meaning of this item, it also referred to believe in Factor IV. Therefore, WHES 35 was not included into Factor II or Factor IV.

Factor 3 consisted of 9 items with factor loadings ranging from 0.423-0.685, and accounted for 3.335% of variance with an eigenvalue of 2.868. An examination of the item content, as shown in Table 9, revealed that these items focused on effort to gain visions and goals of health (4 items), and actions to be healthy (5 items) which were comparable to the hypothesized underlying subscale of the 86-item WHES. Thus this factor was labeled as “Actions to achieve visions and goals of health.”

Factor 4 consisted of 15 items with factor loadings ranging from 0.405-0.708, and accounted for 2.498% of variance with an eigenvalue of 2.149. An examination of the item content, as shown in Table 10, revealed that these items focused on believe and thinking regarding acts of well-being (8 items), feeling of confidence, pride, and contentment to acts of well-being (5 items) and participation in healthy activities (2 items) which were comparable to the hypothesized underlying subscale of the 86-item WHES. Thus this factor was labeled as “Increasing a sense of self-awareness to become and remain healthy.”

Table 7

Items, Factor Loadings, Percent of Variance, Eigenvalue, and Communalities of Factor I (N = 1,384)

Factor I: Assurance to Control Action of Personal Well-Being

| | Items (n = 20) | Factor loadings | Communalities |
|--------|---|-----------------|---------------|
| WHES71 | After conflict with my supervisor, I feel happy that I can come to a place of understanding with my supervisor. | .635 | .463 |
| WHES70 | After having problems with colleagues, I feel happy that I can come to understanding with them. | .605 | .450 |
| WHES73 | If discouraged in life, I feel delighted that I can make changes for the better. | .591 | .447 |
| WHES72 | If tension occurs, I feel delighted that I can organize my life to dissolve the tension. | .579 | .455 |
| WHES74 | I am proud that if psychological problems happen, I can solve these problems. | .576 | .454 |
| WHES85 | I am proud that I am trusted by my supervisor. | .566 | .457 |
| WHES86 | I am proud that I can help friends solve their problems. | .565 | .483 |
| WHES64 | I am confident that working hard makes me wanted in the factory. | .529 | .448 |
| WHES84 | I am proud that I can help my supervisor. | .515 | .452 |
| WHES75 | I am proud that I can work to better myself. | .491 | .508 |
| WHES62 | I am confident that if I am sincere with my friends, they will be the same with me. | .488 | .365 |
| WHES78 | I feel delighted when solving the problems of life. | .486 | .545 |
| WHES66 | I feel happy that if I have allergies, I can heal them. | .464 | .318 |
| WHES63 | I am confident that telling the truth makes me a reliable person. | .463 | .399 |
| WHES77 | I feel delighted that I am able to make my dream a reality. | .454 | .555 |
| WHES76 | I feel delighted that I am able to work to buy something that I want. | .452 | .504 |
| WHES61 | I believe that communication with all people in every age group will help me have more friends. | .447 | .354 |
| WHES69 | If I am to be married I feel content to ask my partner to undergo a blood test prior to marriage. | .430 | .315 |
| WHES83 | I feel happy when participating in family activities. | .407 | .396 |
| WHES67 | I feel delighted to use the factory's medical examinations facility. | .405 | .396 |

Eigenvalue 24.130

% of variance 28.058

Table 8

Items, Factor Loadings, Percent of Variance, Eigenvalue, and Communalities of Factor II (N = 1,384)

Factor II: The Ability to Influence a Reciprocal Community Support in Solving Health Problems

| | Items (n = 15) | Factor loadings | Communalities |
|--------|---|-----------------|---------------|
| WHES30 | I invite my friends to participate in activities for their mental happiness. | .698 | .582 |
| WHES31 | I participate in activities with my friends to reduce tension. | .609 | .489 |
| WHES29 | I invite my close friends to participate in recreational activities. | .592 | .490 |
| WHES39 | I am a mediator between my friends when they have arguments. | .555 | .473 |
| WHES38 | I advise my friends when they have problems with their advisors. | .541 | .475 |
| WHES27 | I have someone who helps me feel content when I am not happy. | .493 | .402 |
| WHES28 | I have my friends to talk to when I feel alone. | .478 | .434 |
| WHES60 | I believe that helping the supervisors makes me acceptable for employment. | .465 | .407 |
| WHES1 | I have ways to make myself healthy. | .449 | .324 |
| WHES19 | I help my friends to compromise with others when they experience conflict. | .443 | .445 |
| WHES23 | I can consult with someone who is a reliable person for me when I cannot sleep. | .442 | .360 |
| WHES52 | I am sure that I can accept my boyfriend when he separates from another woman and comes back to me. | .432 | .196 |
| WHES51 | I am confident that I can calm myself down when someone makes me angry. | .429 | .281 |
| WHES41 | I have friends to visit me when I am sick. | .426 | .389 |
| WHES33 | I help my friends to feel that life is valuable. | .405 | .439 |

Eigenvalue 4.630

% of variance 5.384

Table 9

Items, Factor Loadings, Percent of Variance, Eigenvalue, and Communalities of Factor III (N = 1,384)

Factor III: Actions to Achieve Visions and Goals of Health

| | Items (n = 9) | Factor loadings | Communalities |
|--------|--|-----------------|---------------|
| WHES12 | When I have goals in life, I try as best as I can to reach them. | .685 | .500 |
| WHES11 | I work hard to have an excellent future. | .609 | .399 |
| WHES13 | When I do not reach my goal, I do not reduce my effort to do it the next time. | .604 | .379 |
| WHES10 | If I can save money, I will use it for what I dreamed to have. | .574 | .321 |
| WHES8 | I avoid arguing with others to maintain a feeling of contentment. | .499 | .299 |
| WHES9 | I often prefer recreation to release tension. | .484 | .312 |
| WHES17 | I often join in with family meetings | .474 | .353 |
| WHES18 | If my friends make a mistake at work, I let them know. | .427 | .415 |
| WHES16 | I help to solve family problems when they arise. | .423 | .344 |

Eigenvalue 2.868

% of variance 3.335

Table 10

Items, Factor Loadings, Percent of Variance, Eigenvalue, and Communalities of Factor IV (N = 1,384)

Factor IV: Increasing a Sense of Self-Awareness to Become and Remain Healthy

| | Items (n = 15) | Factor loadings | Communalities |
|---------------|---|-----------------|---------------|
| WHES55 | I believe that to follow a religious life will often bring happiness. | .708 | .545 |
| WHES43 | I believe that eating a healthy diet will keep the body healthy. | .626 | .441 |
| WHES56 | I am confident by acting in a good way, life will be happy. | .597 | .502 |
| WHES54 | I believe that by following my culture, good things will happen. | .575 | .508 |
| WHES15 | When I have followed my religion, I think good things happen in my life. | .572 | .388 |
| WHES42 | I believe that exercising often will help keep me healthy. | .564 | .383 |
| WHES44 | I believe that having a pap smear can help to detect and to treat cervical cancer in the early stage. | .549 | .332 |
| WHES37 | The religion I follow is the same as the rest of my family. | .539 | .405 |
| WHES81 | I feel proud that I have time to practice my religion. | .537 | .439 |
| WHES45 | I am confident that I can take care of myself to maintain my personal health. | .518 | .352 |
| WHES57 | I am confident that if I have an intention to do something, it will be a success. | .473 | .412 |
| WHES80 | I feel content that I participate in cultural activities. | .466 | .453 |
| WHES14 | When I participate in cultural activities, I feel happy. | .445 | .320 |
| WHES36 | When I participate in cultural activities, it is also my good intention to help my dearest friends. | .431 | .337 |
| WHES48 | I believe that if I take care of my health, the risk of being sick is reduced. | .405 | .420 |
| Eigenvalue | | 2.149 | |
| % of variance | | 2.498 | |

The four subscales were examined for correlations using Pearson product-moment. As shown in Table 11, there were statistically significant correlations at a level of .001 between Factors I and III, I and IV, and III and IV and statistically significant correlations at a level of 0.01 between Factors I and II, II and III, and II and IV.

Table 11

Correlations among the Resulting Four Factors of the WHES

| Factor | II | III | IV |
|---|-------|--------|--------|
| I: Assurance to control actions of personal well-being. | .286* | .368** | .458** |
| II: The ability to influence a reciprocal community support in solving health problems. | | .269* | -.269* |
| III: Actions to achieve visions and goals of health. | | | .485** |
| IV: Increasing a sense of self-awareness to become and remain healthy. | | | |

* $p < .01$, ** $p < .001$

3. Analysis of the Research Question: How is the validity and reliability of the WHES?

To assure for construct validity of the WHES, the total sample (N = 1,384) was then split into two groups (N = 692 for each group), first half of samples (N = 1, 3, .. 1,383) and second half of samples (N = 2, 4,..,1,384), and each group sample score was computed on the WHES total score. The test of factor structure stability was answered by subjecting the 59-item WHES of the two groups to factor analysis using EFA. The factor loading cutoff point was set at .40. The results of the two halves of samples are similar to the total samples (N = 1,384) as follows: (1) the four factors consisted of 49 items and explained a total of 42.672% (first half of samples) and 43.753% (second half of samples) of variance respectively, (2) items, factor loadings, percent of variance, eigenvalue and communalities of two groups for four factors are shown in Table 12, Table 13, Table 14, and Table 15 respectively.

Table 12

Items, Factor Loadings, Percent of Variance, Eigenvalue, and Communalities of Two Groups of Factor I (N = 692)

Factor I: Assurance to Control Action of Personal Well-Being

| | Items First half group: N = 20 Second half group: N = 18 | Factor Loadings/ Communalities | Factor Loadings/ Communalities |
|---|---|--------------------------------------|--------------------------------------|
| WHES71 | After conflict with my supervisor, I feel happy that I can come to a place of understanding with my supervisor. | .628/.442 | .676/.520 |
| WHES70 | After having problems with colleagues, I feel happy that I can come to understanding with them. | .579/.434 | .638/.489 |
| WHES73 | If discouraged in life, I feel delighted that I can make changes for the better. | .576/.434 | .655/.495 |
| WHES72 | If tension occurs, I feel delighted that I can organize my life to dissolve the tension. | .582/.459 | .622/.487 |
| WHES74 | I am proud that if psychological problems happen, I can solve these problems. | .496/.429 | .656/.499 |
| WHES85 | I am proud that I am trusted by my supervisor. | .686/.564 | .514/.460 |
| WHES86 | I am proud that I can help friends solve their problems. | .616/.535 | .486/.475 |
| WHES64 | I am confident that working hard makes me wanted in the factory. | .529/.445 | .489/.444 |
| WHES84 | I am proud that I can help my supervisor. | .595/.518 | .445/.482 |
| WHES75 | I am proud that I can work to better myself. | .551/.510 | .548/.549 |
| WHES62 | I am confident that if I am sincere with my friends, they will be the same with me. | - | .504/.388 |
| WHES78 | I feel delighted when solving the problems of life. | .596/.552 | .536/.559 |
| WHES66 | I feel happy that if I have allergies, I can heal them. | .550/.348 | .417/.295 |
| WHES63 | I am confident that telling the truth makes me a reliable person. | .472/.384 | .417/.419 |
| WHES77 | I feel delighted that I am able to make my dream a reality. | .551/.558 | .501/.586 |
| WHES76 | I feel delighted that I am able to work to buy something that I want. | .538/.534 | .476/.536 |
| WHES61 | I believe that communication with all people in every age group will help me have more friends. | .484/.388 | - |
| WHES69 | If I am to be married I feel content to ask my partner to undergo a blood test prior to marriage. | .452/.305 | .532/.381 |
| WHES83 | I feel happy when participating in family activities. | .433/.409 | - |
| WHES67 | I feel delighted to use the factory's medical examinations facility. | .489/.426 | .423/.385 |
| WHES60 | I believe that helping supervisors makes me acceptable for employment. | .410/.414 | - |
| Eigenvalue 17.279 (first half group), 17.225 (second half group) | | | |
| % of variance 29.286 (first half group), 29.195 (second half group) | | | |

Table 13

Items, Factor Loadings, Percent of Variance, Eigenvalue, and Communalities of Two Groups of Factor II (N = 692)

Factor II: The Ability to Influence a Reciprocal Community Support in Solving Health Problems

| | Items | Factor | Factor |
|---------|---|----------------------------|----------------------------|
| | | Loadings/ Communalities | Loadings/ Communalities |
| | First half group: N = 15 Second half group: N = 13 | | |
| WHES30 | I invite my friends to participate in activities for their mental happiness. | .725/.597 | .746/.603 |
| WHES31 | I participate in activities with my friends to reduce tension. | .601/.474 | .722/.557 |
| WHES29 | I invite my close friends to participate in recreational activities. | .615/.490 | .658/.525 |
| WHES39 | I am a mediator between my friends when they have arguments. | .630/.497 | .574/.483 |
| WHES38 | I advise my friends when they have problems with their advisors. | .592/.493 | .590/.493 |
| WHES27 | I have someone who helps me feel content when I am not happy. | .506/.409 | .557/.436 |
| WHES28 | I have my friends to talk to when I feel alone. | .532/.459 | .580/.461 |
| WHES60 | I believe that helping the supervisors makes me acceptable for employment. | - | .551/.435 |
| WHES1 | I have ways to make myself healthy. | .426/.225 | .469/.284 |
| WHES19 | I help my friends to compromise with others when they experience conflict. | .596/.471 | .458/.436 |
| WHES23 | I can consult with someone who is a reliable person for me when I cannot sleep. | .498/.352 | .454/.334 |
| WHES52 | I am sure that I can accept my boyfriend when he separates from another woman and comes back to me. | .453/.212 | - |
| WHES51 | I am confident that I can calm myself down when someone makes me angry. | .414/.281 | - |
| WHES41 | I have friends to visit me when I am sick. | .410/.400 | .521/.413 |
| WHES33 | I help my friends to feel that life is valuable. | .468/.448 | .466/.453 |
| WHES 18 | If my friends make a mistake at work, I let them know. | .430/.418 | - |

Eigenvalue 3.644 (first half group), 4.096 (second half group)

% of variance 6.176 (first half group), 6.942 (second half group)

Table 14

Items, Factor Loadings, Percent of Variance, Eigenvalue, and Communalities of Two Groups of Factor III (N = 692)

Factor III: Actions to Achieve Visions and Goals of Health

| | Items | | Factor Loadings/ Communalities | Factor Loadings/ Communalities |
|--------|--|--------------------------|--------------------------------------|--------------------------------------|
| | First half group: N = 6 | Second half group: N = 8 | | |
| WHES12 | When I have goals in life, I try as best I can to reach them. | | .695/.566 | .788/.606 |
| WHES11 | I work hard to have an excellent future. | | .561/.394 | .738/.530 |
| WHES13 | When I do not reach my goal, I do not reduce my effort to do it the next time. | | .624/.446 | .680/.452 |
| WHES10 | If I can save money, I will use it for what I dreamed to have. | | .565/.370 | .654/.390 |
| WHES8 | I avoid arguing with others to maintain a feeling of contentment. | | .525/.351 | .431/.261 |
| WHES9 | I often prefer recreation to release tension. | | .508/.346 | .437/.326 |
| WHES17 | I often join in with family meetings | | - | .433/.365 |
| WHES18 | If my friends make a mistake at work, I let them know. | | - | - |
| WHES16 | I help to solve family problems when they arise. | | - | .466/.392 |

Eigenvalue 2.277 (first half group), 2.465 (second half group)

% of variance 3.860 (first half group), 4.179 (second half group)

Table 15

Items, Factor Loadings, Percent of Variance, Eigenvalue, and Communalities of Two Groups of Factor IV (N = 692)

Factor IV: Increasing a Sense of Self-Awareness to Become and Remain Healthy

| | Items First half group: N = 14 Second half group: N = 18 | Factor Loadings/ Communalities | Factor Loadings/ Communalities |
|--------|---|--------------------------------------|--------------------------------------|
| WHES55 | I believe that to follow a religious life will often bring happiness. | .761/.578 | .545/.548 |
| WHES43 | I believe that eating a healthy diet will keep the body healthy. | .494/.416 | .441/.507 |
| WHES56 | I am confident by acting in a good way, life will be happy. | .579/.478 | .502/.531 |
| WHES54 | I believe that by following my culture, good things will happen. | .610/.481 | .508/.510 |
| WHES15 | When I have followed my religion, I think good things happen in my life. | .721/.467 | .388/.463 |
| WHES42 | I believe that exercising often will help keep me healthy. | .453/.338 | .383/.452 |
| WHES44 | I believe that having a pap smear can help to detect and to treat cervical cancer in the early stage. | .427/.290 | .332/.381 |
| WHES37 | The religion I follow is the same as the rest of my family. | .593/.453 | .405/.439 |
| WHES81 | I feel proud that I have time to practice my religion. | .624/.503 | .439/.452 |
| WHES45 | I am confident that I can take care of myself to maintain my personal health. | .460/.343 | .352/.331 |
| WHES57 | I am confident that if I have an intention to do something, it will be a success. | .423/.395 | .412/.409 |
| WHES80 | I feel content that I participate in cultural activities. | .576/.544 | .453/.431 |
| WHES14 | When I participate in cultural activities, I feel happy. | .580/.367 | .320/.424 |
| WHES36 | When I participate in cultural activities, it is also my good intention to help my dearest friends. | .484/.370 | .337/.343 |
| WHES48 | I believe that if I take care of my health, the risk of being sick is reduced. | - | .420/.455 |

Eigenvalue 1.977 (first half group), 2.028 (second half group)

% of variance 3.350 (first half group), 3.438 (second half group)

Moreover, hypothesis testing for construct validity that the demographic variables and the WHES showed a significant correlation. They were tested by using Pearson product-moment correlations and correlation ratio (η). As shown in Table 16, as the results display there were significant correlations for two of the four demographic variables (age and personal income) and the WHES total score ($p < .05$). As shown in Table 17, Table 18, and Table 19, the results presented were of significant correlation for all demographic variables including educational level, type of family, and caregivers, and the WHES total score.

Table 16

Correlations among the Demographic Variables and the Resulting Four Factors and the WHES Total Score (N=1,384)

| Factor | Demographic variables | | | |
|---|-----------------------|-----------------|---------------|-------------------------|
| | Age | Personal income | Family income | Number of family member |
| I: Assurance to control action of personal well-being | .049 | -.013 | .014 | -.034 |
| II: The ability to influence a reciprocal community support in solving health problems. | .047 | -.064* | -.083** | -.026 |
| III: Actions to achieve visions and goals of health. | .068* | -.022 | .035 | -.051 |
| IV: Increasing a sense of self-awareness to become and remain healthy. | .060* | -.095** | .006 | -.023 |
| The WHES total score | .064* | -.057* | -.014 | -.037 |

* $p < .05$, ** $p < .01$

Table 17
Analysis of Variance and Correlation Ratio of the Resulting Four Factors and the WHES Total Score by Educational Level (N = 1,384)

| Factor | Education level | M | SD | F | P | eta |
|---|-----------------------|--------|-------|-------|--------|--------|
| I: Assurance to control action of personal well-being | None | 80.81 | 11.08 | | | |
| | Primary school | 81.54 | 10.83 | | | |
| | Secondary school | 81.48 | 10.73 | | | |
| | Vocational level | 80.28 | 12.03 | .849 | .515 | .055* |
| | High vocational level | 81.42 | 11.09 | | | |
| II: The ability to influence a reciprocal community support in solving health problems. | None | 52.58 | 9.04 | | | |
| | Primary school | 54.26 | 9.11 | | | |
| | Secondary school | 52.63 | 9.35 | | | |
| | Vocational level | 54.70 | 9.20 | 2.373 | .037* | .095** |
| | High vocational level | 52.43 | 7.54 | | | |
| III: Actions to achieve visions and goals of health. | None | 34.12 | 5.59 | | | |
| | Primary school | 36.92 | 4.94 | | | |
| | Secondary school | 36.61 | 4.80 | | | |
| | Vocational level | 35.85 | 5.75 | 3.267 | .006** | .110** |
| | High vocational level | 36.90 | 4.59 | | | |
| IV: Increasing a sense of self-awareness to become and remain healthy. | None | 60.85 | 8.09 | | | |
| | Primary school | 64.02 | 7.47 | | | |
| | Secondary school | 63.16 | 7.53 | | | |
| | Vocational level | 62.35 | 8.33 | 2.319 | .041* | .089** |
| | High vocational level | 62.58 | 7.52 | | | |
| The WHES total score | None | 228.35 | 27.35 | | | |
| | Primary school | 236.74 | 27.36 | | | |
| | Secondary school | 233.88 | 27.16 | .279 | .005** | .071** |
| | Vocational level | 233.19 | 31.44 | | | |
| | High vocational level | 233.33 | 25.53 | | | |
| | Bachelor degree | 237.88 | 24.15 | | | |

* p < .05, ** p < .01

Table 18

Analysis of Variance and Correlation Ratio of the Resulting Four Factors and the WHES Total Score by the Type of Family (N = 1,384)

| Factor | Type of family | M | SD | F | P | eta |
|---|----------------|--------|-------|-------|-------|--------|
| I: Assurance to control action of personal well-being | Nuclear | 79.94 | 10.88 | 1.343 | .259 | .055* |
| | Extended | 81.68 | 10.86 | | | |
| | With friends | 82.97 | 8.98 | | | |
| | Alone | 81.58 | 11.76 | | | |
| II: The ability to influence a reciprocal community support in solving health problems. | Nuclear | 51.62 | 8.92 | 3.220 | .022* | .084** |
| | Extended | 53.80 | 9.07 | | | |
| | With friends | 53.06 | 9.44 | | | |
| | Alone | 49.75 | 9.04 | | | |
| III: Actions to achieve visions and goals of health. | Nuclear | 35.95 | 4.68 | 1.538 | .203 | .055* |
| | Extended | 36.86 | 4.96 | | | |
| | With friends | 36.56 | 4.04 | | | |
| | Alone | 36.33 | 4.66 | | | |
| IV: Increasing a sense of self-awareness to become and remain healthy. | Nuclear | 62.38 | 7.50 | 2.383 | .068 | .071** |
| | Extended | 63.55 | 7.53 | | | |
| | With friends | 63.25 | 7.10 | | | |
| | Alone | 59.00 | 11.53 | | | |
| The WHES total score | Nuclear | 229.89 | 26.14 | 2.491 | .059 | .071** |
| | Extended | 235.88 | 27.45 | | | |
| | With friends | 235.83 | 23.28 | | | |
| | Alone | 226.67 | 31.70 | | | |

* $p < .05$, ** $p < .01$

Table 19

Analysis of Variance and Correlation Ratio of the Resulting Four Factors and the WHES Total Score by Caregivers (N = 1,384)

| Factor | Caregivers | M | SD | F | P | eta |
|---|-------------|--------|-------|-------|--------|--------|
| I: Assurance to control action of personal well-being | Relatives | 81.18 | 10.72 | | | |
| | Friends | 84.96 | 9.34 | | | |
| | Supervisors | 86.33 | 9.70 | 4.397 | .002** | .114** |
| | Many groups | 83.27 | 10.50 | | | |
| | None | 80.10 | 14.35 | | | |
| II: The ability to influence a reciprocal community support in solving health problems. | Relatives | 53.44 | 8.99 | | | |
| | Friends | 55.38 | 9.33 | | | |
| | Supervisors | 55.67 | 7.40 | 3.262 | .011* | .095** |
| | Many groups | 54.73 | 7.72 | | | |
| | None | 50.38 | 10.42 | | | |
| III: Actions to achieve visions and goals of health. | Relatives | 36.62 | 4.93 | | | |
| | Friends | 38.18 | 4.50 | | | |
| | Supervisors | 37.78 | 3.26 | 3.417 | .009** | .100** |
| | Many groups | 38.07 | 4.86 | | | |
| | None | 36.00 | 5.34 | | | |
| IV: Increasing a sense of self-awareness to become and remain healthy. | Relatives | 63.21 | 7.51 | | | |
| | Friends | 65.21 | 7.04 | | | |
| | Supervisors | 66.94 | 5.40 | 3.618 | .006** | .100** |
| | Many groups | 64.67 | 7.14 | | | |
| | None | 61.72 | 9.46 | | | |
| The WHES total score | Relatives | 234.45 | 27.09 | | | |
| | Friends | 243.73 | 25.35 | | | |
| | Supervisors | 246.72 | 19.75 | 4.923 | .001** | .118** |
| | Many groups | 240.73 | 26.05 | | | |
| | None | 228.21 | 33.02 | | | |

* p < .05, ** p < .01

To be a valuable tool, the 59-Item WHES was tested for reliability, Cronbach's coefficient alpha (internal consistency) and test-retest method (stability). The results showed in Table 20 and Table 21.

Cronbach's coefficient alpha was computed on each derived factor and the Women Health Empowerment Scale total score of the 59-Item WHES. Table 20 showed that the reliabilities of the four factors and the total scale ranged from 0.811-0.920, and 0.956 respectively. Factor I: Assurance to control action of personal well-being had the highest reliability with alpha of 0.920. While, Factor III: Actions to achieve visions and goals of health had the lowest reliability with standardized alpha of 0.811. However, all four factors and the WHES total score had internal consistency reliabilities.

Table 20

Cronbach's Coefficient Alpha Reliabilities for the Resulting Four Factors and the WHES Total Score and Statistics (N = 1,384)

| Factor | N | M | SD | Alpha | SEM |
|---|----|--------|-------|-------|-------|
| I: Assurance to control action of personal well-being. | 20 | 81.53 | 10.83 | 0.920 | 3.056 |
| II: The ability to influence a reciprocal community support in solving health problems. | 15 | 53.51 | 9.09 | 0.886 | 3.065 |
| III: Actions to achieve visions and goals of health. | 9 | 36.75 | 4.91 | 0.811 | 2.138 |
| IV: Increasing a sense of self-awareness to become and remain healthy. | 15 | 63.38 | 7.57 | 0.894 | 2.464 |
| The WHES total score | 59 | 235.17 | 27.29 | 0.956 | 5.758 |

The final step of developing the WHES, test-retest was used to confirm the reliability of the 59-Item WHES. This technique was satisfactory when a sample of 33 women in factories was tested after a 2-week interval (Kubiszyn & Borich, 1984). The four subscales and the total scale were examined for correlations using Pearson product-moment. Table 21 showed that there were significant correlations for the four subscales and the total scale between the first and second test at a level of .001 (r ranged from 0.606-0.724).

Table 21

Means, Standard Deviations, and Reliability Coefficient of the WHES (N = 33)

| Factor | First test | | Second test | | r |
|---|------------|-------|-------------|-------|---------|
| | M | SD | M | SD | |
| I: Assurance to control action of personal well-being. | 84.27 | 8.61 | 87.36 | 7.17 | 0.700** |
| II: The ability to influence a reciprocal community support in solving health problems. | 54.45 | 6.79 | 58.27 | 5.78 | 0.606** |
| III: Actions to achieve visions and goals of health. | 37.91 | 4.23 | 39.52 | 4.09 | 0.724** |
| IV: Increasing a sense of self-awareness to become and remain healthy. | 63.79 | 5.96 | 67.15 | 5.54 | 0.682** |
| The WHES total score | 240.42 | 20.41 | 252.30 | 18.89 | 0.723** |

** p < .001

Discussion

The Women Health Empowerment Scale presented in this study represents one of the relative efforts to develop a measure of empowerment. Although other measures of empowerment have been developed (Anderson et al., 2000; Bolton &

Brookings, 1998; Faulkner, 2001; Shiu et al., 2003; Wowra & McCarter, 1999), this measure focused on an individual level of empowerment and women's health of female factory workers that at the time was nonexistent. The main purpose of this study was to develop a valid and reliable instrument to explore the components of the Women Health Empowerment Scale (WHES) for Thai female factory workers.

By subjecting the original 86-item WHES to principal components of analysis, the initial solution yielded 16 factors with an eigenvalue greater than 1. An examination of the Scree plot indicated that 3, 4, and 5 factors should be examined. From the qualitative phase, the WHES was hypothesized to have 4 underlying dimensions; a 4-factor solution using varimax and oblique rotations was originally specified. The factor loading cutoff point was set at .40. Kline (1993) proposed factor loading greater than .30 can be regarded as significant. Theoretical congruence in each factor was considered as criteria for factor solution. Finally, the 4-factor oblique solution was also judged to be the most parsimonious and interpretable. The results of the WHES as a total scale and the four factors with 59 items of the WHES had high reliabilities ($\alpha = 0.9555$ and $0.8106 - 0.9204$ respectively). The four factors included: Factor I: Assurance to Control Action of Personal Well-Being (20 items), Factor II: The Ability to Influence a Reciprocal Community Support in Solving Health Problems (15 items), Factor III: Actions to Achieve Visions and Goals of Health (9 items), and Factor IV: Increasing a Sense of Self-Awareness to Become and Remain Healthy (15 items). The discussion of the findings is presented in two parts; the components of the Women Health Empowerment Scale and its psychometric properties.

1. The components of the Women Health Empowerment Scale

Factor I: Assurance to Control Action of Personal Well-Being

First factor, this consisted of 20 items with factor loadings ranging from 0.405-0.635. This factor was labeled as “Assurance to Control Action of Personal Well-Being.” The first factor incorporated 16 items from subscale IV (“A sense of achievement to well-being) of the original 86-item WHES and four items from subscale III (A will-power to achieve visions and goals of health). The first component in this study was similar to “power”, one of five subscales of the empowerment scale with an outpatient mental health population (Wowra & McCarter, 1999), and “self-esteem-self-efficacy”, one of five subscales of the empowerment scale with consumers of mental health services (Rogers et al., 1997). The major items (16 of 20 items or 80%) of the first factor in this study were drawn from subscale IV and the rest of the items (4 of 20 items or 20%) also reflected that self-confidence was necessary for well-being. For example, WHES 61 stated, “I am confident that communication to all people in every age group will help me have more friends.” This example was the same as another study, such as “I feel confident in my ability to help my child grow and develop” (Singh & Curtis, 1995). Tomich and Helgeson (2002) indicated that beliefs about personal control are most strongly associated with quality of life.

According to Akey, Marquis and Ross (2000) and Dhammasaccakarn (2000), it is plausible that empowerment influences the individual’s feelings of competence and control. In addition, the psychometric characteristics of the Family Empowerment Scale (FES), the investigators present perceptions of ability and competence as two of the four factors of FES (Singh & Curtis, 1995).

Factor II: The Ability to Influence a Reciprocal Community Support in Solving Health Problems

The second factor consisted of 15 items with factor loadings ranging from 0.405-0.698. This factor was labeled as “The Ability to Influence a Reciprocal Community Support in Solving Health Problems.” Chamberlin (1997) stated that empowerment does not occur to the individual alone, but has to do with experiencing a sense of connectedness with other people. For instance, in the area of school cultures, principals can work toward fostering a climate in which teachers feel safe and able to work together collaboratively and professionally (Edwards et al., 2002). On the other hand, workers in factories feel content if they are able to work together with their supervisors or colleagues. One woman in this study said, “I feel happy when I can help my supervisors.” Importantly, reciprocity involves negotiation of meaning and power (Joan & Kenny, 2002). Like a measure of empowerment scale, Speer and Peterson (2000) found that “power developed through relationships” is one of three subscales for cognitive empowerment. Similarly to the Family Empowerment Scale (FES), systems advocacy, such as professionals and families, is one component of the FES (Singh & Curtis, 1995). Moreover, without some resources, the ability to maintain health and well-being is tenuous (Eugenie, 2002).

The second factor incorporated items from the three subscales of the original 86-item WHES. This factor encompassed two items from subscale I (Awareness of health), 10 items from subscale II (A reciprocal community support in solving health problems), and three items from subscale III (A will-power to achieve visions and goals of health). This factor was labeled as “The ability to Influence a Reciprocal Community Support in Solving Health Problems” for two reasons. First,

more than 50 percent (10 items or 67%) was drawn from subscale II of the original 86-item WHES (A reciprocal community support in solving health problems). Second, the rest of the items (5 items or 33%) showed the meaning of “a reciprocal community support.” For example, WHES 19 from the first factor of the original 86-item WHES “Awareness of health” subscale stated, “I help my friends to compromise with others when they have conflicts.” Similar to an item from the third factor of the original 86-item WHES “A will-power to achieve visions and goals of health” (WHES 60) stated, “I believe that helping supervisors makes me acceptable for employment.” As Speer and Peterson (2000) found, a measure of cognitive empowerment at an individual level was the assessment of a critical understanding of the forces that shape the environment in a community-organizing context. There was a subscale focused on an understanding that interpersonal relationships are the source of power. Moreover, the results from the previous study (Finfgeld, 2004), showed support is an attribute of an empowerment. For example, individuals possess some degree of self-efficacy to become empowered. However, individual barriers include lack of motivation and impaired cognitive ability. Therefore, nurses are encouraged to foster their development by nurturing a sense of self-confidence, personal integrity, and responsibility.

Factor III: Actions to Achieve Visions and Goals of Health

The third factor consisted of nine items with factor loadings ranging from 0.423-0.685. It incorporated all items from the subscale I of the original 86-item WHES “Awareness of health.” However, subscale I of the original 86-item WHES consisted of thoughts, feelings, and actions of one’s own right to gain control over one’s health. Therefore, this factor was focused on action and labeled as “Actions to

Achieve Visions and Goals of Health.” The third factor was similar to the previous study of women in the work-based welfare program in the U.S. Midwest. The women often defined their sense of empowerment in relationship to energy. For instance, statements included “I have the motivation to get the kind of job I really like. I have the attitude and stride to keep going forward and working hard. In the long run, I will find the kind of job I would really like to find” (Eugenie, 2002: 367).

This factor was labeled as “Actions to Achieve Visions and Goals of Health” because all items reflected participation, action, and goals for example WHES 11: I work hard to have an excellent future. Consistent with the three previous studies: “Nurse empowerment, job-related satisfaction, and organizational commitment” (Kuokkanen, Leino-Kilpi & Katajisto, 2003), “Empowerment of individuals with enduring mental health problems: Results from concept analyses and qualitative investigations” (Finfgeld, 2004), and “Validation of scores on the psychological empowerment scale: A measure of empowerment for parents of children with a disability” (Akey et al., 2000), the findings show that activity and participation are crucial elements of empowerment. Moreover, most women wanted to participate in decisions about their care. For instance, women who had a cervical cytological abnormality often found it difficult to get the information they required from doctors because they were confused by what their doctors told them and felt unable to ask questions in the consultation (Kavanagh & Broom, 1997). Finally, of the various theories for humans, having a sense of purpose in life is correlated to quality of life (Tomich & Helgeson, 2002), and having a sense of achievement is part of empowerment (Harley, 1995).

Factor IV: Increasing a Sense of Self-Awareness to Become and Remain Healthy

The fourth factor consisted of 15 items with factor loadings ranging from 0.405-0.708. The fourth factor in this study incorporated items from all subscales of the original 86-item WHES. This factor encompassed two items from subscale I (Awareness of health), two items from subscale II (A reciprocal community support in solving health problems), nine items from subscale III (A will-power to achieve visions and goals of health), and two items from subscale IV (A sense of achievement to well-being). This factor was labeled as “Increasing a Sense of Self-Awareness to Become and Remain Healthy” because all items reflected feelings, for example WHES 14: When I participate in my cultural activities, I feel happy, or WHES 81: I feel proud that I have time to practice my religion.

Phillips and Silvia (2005) found that self-awareness moderated the link between discrepancies and emotions. Without self-awareness, it would be difficult for people to exercise self-control, produce creative accomplishments, and experience pride and high self-esteem (Silvia & O’Brien, 2004). The last factor is also supported by previous research (Cox & Parson, 1994; Eugenie, 2002; Zimmerman, 1995; Zimmerman & Warschausky, 1998). Empowerment does not appear to occur without a basic sense of well being (Eugenie, 2002), and quality of life (Rogers et al., 1997). “A Sense of Self-Awareness” can help women in factories to take action for health maintenance and health improvement. For example, one participant in the qualitative study said, “Nobody tells you how to protect yourself from the danger in a factory. You must be careful and think about it at all times when you are working on the line.” This is similar to the results of women diagnosed with breast cancer who believe

personal control to be important for their life (Tomich & Helgeson, 2002). In addition, another study from “Empowerment as a Process of Evolving Consciousness: A Model of Empowered Caring” showed that increased awareness to be critical to conceptualized empowerment. That awareness included awareness of one’s own strengths and limitations, and one’s own rights to have control over personal/family health issues, and a voice in decisions directly affecting one’s health (Falk-Rafael, 2001).

2. The Psychometric Properties of the WHES

The WHES offers a valid and reliable measure of empowerment related to health for female factory workers in Thailand. The findings of this study provide support for content validity (CVI = 0.94), construct validity, internal consistency ($\alpha = 0.956$), and testing stability (test-retest method, $r = 0.723$) of the WHES. Therefore, the WHES would represent a valuable quality assurance instrument. The discussions of the WHES as a valuable tool are as follows:

2.1 The process of developing the WHES consisted of various techniques. Berg (2001) recommended that researchers be instructed in the use of research strategies composed of multiple methods in a single investigation. In this study, the qualitative method started with the extensive review of literature and in-depth interviews. Moreover, the methodological triangulation technique, individual in-depth interview and a focus group interview, was used to validate the results of the qualitative study. Especially in-depth interviews, the process of quoting involved considerations in the empirical study. Generally, quotes are used to validate research findings and to vitalize the research report (Sandelowski, 1994). Gregory (2000) presented the method of empirical keying that can produce some interesting surprises.

From the practical standpoint of empirical scale construction, theoretical considerations are of secondary importance. Then, the quantitative study was carried out by dividing it into six stages including (1) develop an items pool, (2) determine a content validity index, (3) pilot tested the WHES, (4) first testing of field tested, (5) second testing of field tested, and (6) final testing of field tested.

2.2 The WHES had a sufficient pool of items from the initial phase of developing the scale. First, the WHES was made up of 96 items with four factors of the scale. After review from experts, pilot testing, and assessing an item's ability to discriminate and reliability twice, the WHES remained at 86 items. By subjecting the 86-item WHES to principal components analysis with a whole group ($N = 1,384$) and by splitting the sample into two groups ($N = 692$), four factors of 59 items had a high reliability of 0.956. In addition, to confirm the reliability of the WHES, test-retest techniques were used. The results demonstrated significant correlations of subscales and total scale of the WHES between first test and second test were acceptable (r ranged from 0.606-0.724, $p < .001$). Similarity, Shiu et al. (2003) found the test-retest of Chinese Diabetes Empowerment Scale (C-DES) was 0.75. Both of them (WHES and C-DES) showed significant correlations that were acceptable (higher than 0.7) (Kubiszyn & Borich, 1984).

As the length of the scale increased, the chance errors of measurement more or less cancel out; the score comes to depend more and more completely upon the characteristics of the person being measured; and a more accurate appraisal of the person is obtained (Thorndike & Hagen, 1977). Kline (1993) recommended ten items to be the absolute minimum for a reliable scale and the more items the higher the reliability.

2.3 The items of the WHES were written in the five-point Likert scale format appropriate to measure the construct of empowerment. To measure the construct of empowerment, the format to make choices: “yes or no” was not appropriate (Chamberlin, 1997). Furthermore, a Likert scale with a mid-point is fitting for Asian countries (Lee et al., 2002). Therefore, the WHES was the five-point Likert scale format that had well-defined criteria for answers to each question. The problems of subjective judgment and blank responses in scoring of the WHES as a source of measurement error were minimized (Gregory, 2000).

2.4 The language and the content of the WHES were developed from the reality of the samples. One woman in this study said “the contents of the questionnaire happened in real life.” Another woman said, “the contents are the same as me.”

2.5 Several content experts reviewed the WHES: a five expert committee in the qualitative study and a seven expert committee to determine a content validity index in the quantitative study. Morton (1996) presented experts as sources of certainty. Many people accept experts without questions.

2.6 A ratio of subject for each item in this study was 16:1. This ratio was more than the criteria of Munro (2001). Munro (2001) proposed a ratio of at least 10 subjects for each item is desirable for instrument development.

2.7 The high response rate of 81.41 percent in this study provided the generalization of the findings. In comparison to one previous study, the researchers mentioned the low response rate of 16.5 percent, which may bias the results and limit the generalization of their findings (Wowra & McCarter, 1999).

2.8 Results suggested that the correlations of most demographic variables (age, personal income, educational level, type of family, and caregivers) with the WHES total score ($p < .05$, and $.01$) provide direction for health care providers in working with female factory workers. Except family income and number of family members, which did not offer significant correlations with the WHES total score. This may be explained, as the WHES is a valid measure of the previous studies. Similarly, Edwards et al. (2002) found that empowerment tended to increase with higher education. Moreover, Rogers et al. (1997) stated that empowerment was related to income.

Summary

This chapter presented the results of analyses of sample characteristics and two research questions. The subjects were 1,384 women who worked in the ten inclusion criteria factories of this study. 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%).

Research question 1 asked for the components of the WHES. The four factors consisted of 59 items and explained a total of 39.276 % of variance. The resulting four factors included: (1) Assurance to control action of personal well-being, (2) The ability to influence a reciprocal community support in solving health problems, (3) Actions to achieve visions and goals of health, and (4) Increasing a sense of self-awareness to become and remain healthy.

Research question 2 asked for the validity and reliability of the WHES. The findings of the psychometric properties of the WHES included (1) a content validity index, which was 0.94, (2) construct validity using EFA on the total sample and then splitting the sample into two groups and performing it again. The results showed the similarity in factor items, factor loadings, variance percentage, eigenvalue and communalities, (3) hypothesis testing displayed significant correlations for most of the demographic variables and the WHES total score, (4) Cronbach's coefficient alpha internal consistency reliability demonstrated the alpha of the four factors and a total scale ranging from 0.811-0.956, and (5) testing stability using test-retest techniques showed the reliability coefficient of the WHES subscales and the total scale ranged from 0.606-0.724 ($p < .001$).

In brief, based on feminism philosophy and theory, it can be used to guide and understand issues related to empowerment and women (Im & Meleis, 2001) in Thai culture. Therefore, the Women Health Empowerment Scale (WHES) in this study is offered as a valuable tool for assessment of female workers in factories throughout Thailand.