CHAPTER V

CONCLUSION AND DISCUSSION

This content of this chapter are divided into four parts. Firstly, conclusion of the study is drawn based on the findings. Secondly, research findings are discussion based on the objectives of the study. Thirdly, implication of the study results regarding nursing practice and nursing research were presented. Lastly, recommendation for future research and limitation of the study are depicted.

Conclusion

The purposes of the study were to develop the Thai family health routines scale (TFHR scale) and to establish initial psychometric properties. In the part of conclusion, there are discussions on two parts; scale construction and psychometric testing.

1. Scale construction

Constructing the TFHR Scale started by clarifying concept of family health routines based on the structural domain of the Family Health Model (Denham, 2002; 2003a). Then, operational definitions of the concept and its constructs were identified. The pool of 206 items, which reflected routine health behaviors of Thai family, were generated based on the operational definitions that previously identified. Regarding item generation, reviewing literature and in-depth interview of 13 Thai families were performed to collect detail of Thai family health routines for wording 206 item statements.

The pool of 206 items was introduced to a panel expert of family nursing for conducting content validity. After validating the content, 145 items were put in the first draft of the TFHR scale. An item analysis (n=145) and item review (n=15) were conducted on examining the first draft scale. Finishing on scale construction phase, 85 items were selected to create the second draft of the TFHR scale which was introduced to test construct validity.

2. Psychometric testing

Testing psychometric properties, construct validity using confirmatory factor analysis (n=1040) was firstly conducted on the second draft scale. After conducting first order factor analysis, the number of 85 items in the second draft was reduced to 70 items which composed to be the final version of the scale, called the Thai Family Health Routines (TFHR) scale. Then, testing psychometric properties on the TFHR scale were performed to examine construct validity using criterion related validity (n=100), and contrasted-groups approach and internal consistency reliability (n=60).

There were two types of construct validity testing, confirmatory factor analysis and contrast groups approach. The second order factor analysis was use to test the hypothesized factor structure model specified as having 6 uncorrelated factors and 25 indicators with measurement errors. Confirming the hypothesized model, the results showed that the model was not fit to the model data. After modifying the hypothesized model, the results of overall model fit showed that all of fit measure indices of the modified model met criteria of good model fit. Additionally, factor loadings of all 25 indicators were statistically significant. Therefore, it could be

conclude that all of the six factors can predict the family health routines construct significantly.

In contrasted-groups approach, the TFHR scores on a healthy family group were significantly different from the TFHR scores on unhealthy family group (t = 0.38, p < .01). The criterion related validity of the TFHR scale was also examined. Its result showed that a positive correlation between the Thai Family Health Routines' scores and the Chulalongkorn Family Inventory's scores were at moderate level (r = 0.64, p < .001). This result supported the concurrent validity of the TFHR construct. Regarding internal consistency reliability, Cronbach's alpha coefficient of total scale was 0.91 and of the six subscales ranged from 0.54 to 0.77.

After testing psychometric properties, it could be stated that the TFHR scale is a newly valid and reliable research instrument that could be used to measure health of Thai family. The TFHR scale was a self-report with 4-point rating scale ranging from "0 = never" to "4 = always". The scale composed of 70 items with six subscales including self-care routines, safety and prevention routines, mental health behavior routines, family care routines, family caregiving routines, and illness care routines. According to the TFHR scale composed of both positive and negative statement, recoding score on negative statement items should be done before summated total score. The total score of the TFHR scale will be obtained by summing raw scores across 70 items on six subscales and can range from 0 to 225. A higher score indicates a greater likelihood of healthy family.

Discussion

This study has undertaken the necessary steps to develop and test psychometric properties of the TFHR scale. Research issues for discussion composed the topics of 1) characteristics of the samples, 2) the Thai Family Health Routines Scale, and 3) psychometric properties of the Thai Family Health Routines Scale.

1. Characteristics of the samples

The samples of this study were divided into three groups; the samples for pilot study, pretest study and main study.

In pilot study, characteristic of 13 participants for family in-depth interview represent various family types, socioeconomic statuses, occupations, and area of living except religion since most of participants were Buddhists. Religion might be limitation for generalizing the finding.

In pretest study, the important issue on characteristics of the samples for pretest is that they should representative the same characteristics as the samples for main study (Nunnally and Berstein, 1994; Pett, Lackey, and Sullivan, 2003). Comparing characteristics of the samples, it was found that percentages of major occupation of family, family income, current resident place, and status of house occupying in samples of pretest study were similar to those in the samples in main study. Even though, percentages of extended and nuclear family with at least one child were obvious different, the samples in pretest study represent almost characteristics of the samples in main study.

In main study, 1,040 families were recruited for testing construct validity of the TFHR scale using confirmatory factor analysis. The sample size in this study was sufficient for generalization findings to the target population and sufficient for reducing sampling error because the number of samples met the ratio of samples per item that would be 10:1 (Dixon, 2001; Naunnally and Bernstein, 1994 Naunnally and Bernstein, 1994; Comrey and Lee cited in Pett, Lackey, and Sullivan, 2003).

Considering heterogeneity of the samples, the researcher collected data from various randomized settings by using multi-stage sampling method. Therefore, characteristics of the samples represented the variety of family types, socioeconomic status, and modernization of living areas. The variety characteristics of the samples of main study implied that the TFHR scale could be used in families living in both rural and urban areas, and could be used in various family types including nuclear family, extend family and single-parent family as well.

2. The Thai Family Health Routines (TFHR) Scale

The TFHR scale is a valid and reliable family instrument for measuring health of Thai family in various forms including nuclear family, extend family, and single-parent family through family health routines constructs. The scale provides concreted constructs as a new perspective to measure family health concept.

From reviewing literature, most of existing definitions of family health based on nursing perspective, definition of family health incorporate a functioning focus, biopsychosocial focus, aspect of wellness, and environmental interaction affecting both family members and the family unit (Anderson and Tomlinson, 1992). Comparing the constructs of the TFHR scale among family instruments used to measure family health concept in various family forms. It was

found that almost existing family instruments focus on interaction processes within the family and with environment in terms of family functioning and family relationship (Friedmann, 1998; Lasky and others, 1997; Moos, 1994; Moos and Moos, 1976; Olson and others, 1994; Pless and Satterwhite, 1973; Reidy and Thibaudeau, 1984; Robert and Feethem, 1982; Skinner and others, 1983; Smilkstein, 1978). The constructs of these instruments emphasized on psychosocial and spiritual aspect of family health, and often lack of construct involved physical aspect of family health. For Thai family functioning instruments, Chulalonkorn Family Inventory (Umaporn Trangkasombat, 1997) and the Thai Family Functioning (Suttiamnoykul; 2002), their items also translated from western instrument which might have limitation about context of Thai family.

According to definition of the family health, the TFHR scale is a comprehensive family instrument used to measure overall aspect of family health concept through the six routine health behaviors. For example, self-care and illness care routine involved dietary practice, sleep and rest pattern, hygiene care, exercise and physical activity, sexuality, and ways family overcome illness conditions of family members reflect physical aspect of family health. Safety and prevention routine involve prevention of disease and injury, and avoidance risk behavior reflect interactions with family environment which affect health of individual member and health of a whole family. Mental health behavior and family care routines involved self-esteem, personal integrity, work and play, stress management, family fun, humor, spiritual and religious practice reflect psychosocial and spiritual aspect of family health. Family caregiving routine involved household task, health teaching, resource management and socialization reflect family functions.

Although the TFHR scale was developed based on western model, the structural domain of the Family Health Model (Denham, 2003), all items of the scale were derived from Thai literature and findings of in-depth interview with Thai families. Additionally, the structural model was analyzed during reviewing literature and the in-depth interview, and found that the model can apply and fit to Thai culture.

The TFHR scale is developed based on context of Thai family reflects the ways Thai family can obtain desired characteristics which assume to be a healthy family. The scale is sensitive to Thai culture which does not exist in other family instruments based on western culture. When considering the item statements, the TFHR scale is more practical family measure. The scale provides item statements which reflect specific questions on actual behaviors emerging within the family in daily life that easily recall and answer. Therefore, TFHR scale seems to be useful guidelines for assessing families and can help nurses identify specific behavioral problem for designing appropriate intervention strategies to improve health of the family.

3. Psychometric properties of the Thai Family Health Routines Scale

3.1 Construct validity

The transition from a conceptual framework of family health routine concept to operational definitions indicates validity of the TFHR scale. Conceptual and operational relation is the measurement assumption which can be supported by validity testing (Mishel, 1998). Based on the Structural Domain of the Family Health Model, the components of Family Health Routines (FHR) were identified as having 6 categories (Denham, 2003a). After reviewing literature and conducting in-depth interview, constructs of FHR based on context of Thai family

were still composed of the original six categories; self-care, safety and prevention, mental health behavior, family care, family caregiving, and illness care routines used as the factor structure for testing construct validity of the TFHR scale.

Confirmatory factor analysis using LISREL program was employ to examine construct validity of the TFHR scale which composed of six factors. The result showed that the proposed model was accepted as a good fit model. It could be concluded that the components of Thai family health routines concept that congruence with the family health routines proposed by the structural domain of the Family Health Model (Denham, 2003a), were supported by the empirical data testing.

Regarding factor loadings, regression coefficients of all 25 indicators were statistically significant ($p < .05$). It was notified that one indicator named regular behavior related to work and play accounted for very low factor loading ($b = 0.07$). Although, it could be stated that this indicator could predict a very small amount of variation on mental health behavior factor, this indicator keeping full meaning of mental health behavior routines.

In summary, the result of confirmatory factor analysis provide the empirical evidence to support the proposed construct of Thai family health routines in that this concept composes of 6 factors with 70 items. In addition, the factor structure of the TFHR scale is confirmed to be a valid measurement.

3.2 Criterion related validity

The criterion related validity in this study was examined by relationship between scores obtained on the TFHR scale to scores for the same persons produced by the Chulalongkorn Family Inventory (CFI) that also present in the phenomena of family health. The result showed that correlation between the TFHR scores and the CFI score was positive which supported the concurrent validity;

however, the correlation coefficient value was not high magnitude but statistically significant (r = 0.64, p < .01). It is important to point out that the moderate relationship between scores on TFHR and CFI might from measuring some different scopes of family health used to guide the scale development. The CFI (Umaporn Trngkasombat, 1997) was developed underlying only psychosocial aspect of family health, whereas the TFHR scale was developed underlying biophysical, psychosocial, spiritual, and cultural aspect of family health (Denham, 2003a). Therefore the two scales might share similarity on only psychosocial and spiritual constructs of family health which indicates the moderate positive correlation coefficient. Since the FHR is very new concept, the gold standard for the TFHR scale is unavailable and family health routines is a significant predictor of family health (Denham, 2003a), the TFHR should be considered to verify the evidence for predictive validity.

3.3 Contrasted-groups approach

According to the TFHR scale was expected to be a research instrument and a screening tool in clinical setting, contrasted-groups approach was conducted to test its construct validity. In contrasted-groups approach, conducting independent-sample t test to determine difference in routine health behaviors of healthy families and unhealthy families was an appropriate method. Even though, the sample size of each two groups; healthy and unhealthy family, was small (N=30), the scores on TFHR scale of each group demonstrated normal distribution as shown in non-significant on One-Sample Kolmogorov-Smirnov Test.

Considering testing results, the evidence of construct validity on the TFHR scale was supported to be a valid scale by which the mean scores on the TFHR scale of two contrasting groups; healthy and unhealthy family, were significantly different. The result was congruence with theoretical basis in that the mean score on

TFHR of the healthy family group was greater than those of unhealthy family group. According to family health routines was defined as regular behaviors that family used to maintain, regain, and promote health of the family (Denham, 2002; 2003a), families which have better routine health behaviors should get better family health as well.

3.4 Reliability

Regarding reliability, the internal consistency reliability was employed. With the value of alpha coefficient, the TFHR scale revealed a reliable scale since Cronbach's alpha coefficient of the total scale was .91 which fell in acceptable level for a newly developed instrument, at least .70 (Burns and Grove, 2005; Knapp and Brown, 1995; Nunnally and Bernstein, 1994). In other words, the total TFHR scale has satisfactory internal consistency reliability.

Considering the correlation matrix of the TFHR scale, it was found that there is no item-item correlation greater than 0.7 which indicates redundant items (Brink and Wood, 1998) influenced on high Cronbach's alpha coefficient. Therefore, the very high Cronbach's alpha coefficient ($\alpha = 0.91$) may influences from a long test length (Brink and Wood, 1998; Waltz and other, 1991) of which the TFHR scale composes of 70 items or the scale itself is highly reliable.

Considering subscales, safety and prevention routines and illness care routines show unsatisfied level of internal consistency reliability due to Conbrach's alpha of both subscales < .07. For safety and prevention routines, the alpha was .67 which closed to the satisfied level. In case of illness care routine, the alpha falls in unsatisfied level ($\alpha = .54$). For this subscale, the scores should not interpret alone by itself.

Implications

Based on the results of this study, the usefulness of the TFHR scale was addressed as implications for nursing research and practice.

1. Implication for nursing practice

1.1. Family or community nurses can identify unhealthy or high risk unhealthy families with low scores on the TFHR scale.

1.2. Each item of the TFHR represents a visible behavior that individual and collective members of the family routinely act. Using the content of item statements as a matter for consideration, nurses could identify behavioral problems of the family and can assist families to deal with some difficulty routines health behaviors which negatively affect to health of individual members and a whole family.

2. Implication for research purpose

2.1 The results of this study show that the TFHR scale is a valid and reliable research instrument. Therefore, the scale can provide valid result for measuring family health as an outcome of research intervention which expects to be useful for family nursing.

2.2 The TFHR scale is useful for creational research study in order to find out the factors which influence on family health and family health routines of Thai family.

Recommendation for further research

The TFHR scale is a very new research instrument. A lot of further studies are requested.

1. The TFHR scale should be revised due to Cronbach's alpha of illness care routine and safety and prevention routines subscales are less than satisfy level of newly instrument ($\alpha < 0.7$).

2. The TFHR scale developed in this study focused on general Thai families living in the central region of Thailand only. For further study, the TFHR scale would be extensively tested in families living in the other regions of Thailand and in various conditions such as families of which their members experiencing with chronic illness, childbearing family, etc.

3. To find out the families which is being at risk or unhealthy, study on norm-reference to find out the cut off score would be obtained to differentiate unhealthy family, or family risky to unhealthy form healthy families.

4. For clinical purpose as a diagnostic tool, TFHR scale should be tested for item sensitivity and specificity.

Limitation of the study

Limitations of this study concern about samples of the study which were Thai families living in central region of Thailand only, and limitation of religion difference. According to this study was set up in central region of Thailand; using the TFHR with Thai families living other regions should take more consideration about cultural difference especially minority family groups.

In case of religion difference, the item pool of this study was coming up with in-depth interview with only Buddhist Thai families; therefore, generalizing research finding to other religion families may has limitation. When using the scale in other religion families, it should be considered the influences of the religion on routine health behaviors.