

Development of a Food Insecurity Screening Instrument

Noppawan Piaseu PhD, RN*,
Surat Komindr MD**, Sukanya Tantiprasoplap MEd, NP***,
Nattha Soranansri RN****, Suporn Chareonpanich RN****

* Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
** Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
*** Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
**** Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Background: Food insecurity is a dynamic, global issue requiring our constant attention today, and practical assessment instruments are needed to detect food insecurity in various populations and countries. A screening tool for food insecurity was developed and tested its psychometric properties.

Material and Method: The Food Insecurity Screening Instrument (FISI) was developed based on literature review and qualitative data from a sample of 30 female who were family food providers in crowded urban communities in Bangkok.

Results: Content validity was determined by five experts, resulting in a good content validity index. It was tested with another 350 food providers, resulting in high reliability. Item analysis revealed good internal consistency of items to total scale, except for two items which were deleted. Construct validity was determined using exploratory factor analysis, and revealed four factors, consisting of 33 items, food quantity, food quality, food safety, and anxiety about food. These factors together explained 74.9% of total variance of the new tool.

Conclusion: This new tool provides a valid and reliable means of screening for food insecurity in families and communities. Policy makers in Thailand have supported the usefulness of the instrument which has already been used across the country for the National Survey, and after the 2011 Thai floods.

Keywords: Food insecurity, Instrument development, Urban, Community

J Med Assoc Thai 2016; 99 (2): 231-8

Full text. e-Journal: <http://www.jmatonline.com>

Food insecurity is a global with multidimensional issue including food production, access, and utilization⁽¹⁾ and relating to advanced technology, agricultural and industrial, social, political aspects, and policy⁽²⁾. Food insecurity contributes to significant health impacts, resulting from hunger and undernourishment⁽³⁾. Reduction of extreme poverty and hunger is one of the Millennium Developmental Goals (MDGs) to be achieved by the year 2015, as stated by the United Nations in 2000. Through multi approaches, hunger has been reduced to one in eight persons worldwide who are more likely to have not enough food⁽³⁾.

Thailand is ranked as the moderate level of food insecurity associated with issues on accessibility at the household level resulting from the 2008 food price crisis and low purchasing power⁽¹⁾. Thailand is

influenced by technological advancements that change the society towards urbanization with more people from the rural areas migrating into slum areas in the city for job opportunity. Recently, poverty rate has decreased to 7.8%⁽⁴⁾, and the gap between the rich and the poor as indicated by the Gini Index was decreased to 39.4% in 2010⁽⁵⁾. Thailand had a significant reduction in undernourishment⁽³⁾. While efforts have been made towards the Millennium Developmental Goal, monitoring food insecurity is essential.

However, there is a limitation of body of knowledge on approaches to measure and monitor household food insecurity. There is almost no data on food insecurity in the context of poverty, particularly among people living in slum areas in the city. It has been found that the problems with food insecurity still exist^(6,7). In fact, the problems with food insecurity tend to increase in their severity and result in nutritional problems, thus adversely affecting health and quality of life. It also results in economic losses due to increased healthcare expenses and burdens on the family and society at large. All of these issues have remained unclear for policy makers. Therefore, it is necessary to develop screening tool for food insecurity

Correspondence to:

Piaseu N, Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University Bangkok 10400, Thailand.

Phone: +66-2-2012895

E-mail: noppawan.pia@mahidol.ac.th

so that prevention can be planned at the household level and a national policy on food insecurity can be devised. This study aimed to develop and test psychometric properties of the “Food Insecurity Screening Instrument” for families in urban slum.

Assessment of Food Insecurity

Food insecurity can be measured at both macro and micro levels. At a macro level, the Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) has been developed based on economic status to reflect food insecurity situation. The Thai FIVIMS, classified by provinces, was also developed as a tool used by policy planning. Assessment of food insecurity includes different approaches: family income and expenditure are major indicators of food insecurity⁽⁸⁾. However, such data alone may not be sufficient to accurately indicate food insecurity.

At micro level, dietary assessment including dietary intake is another indicator of food insecurity. Dietary records can be measured with the 24-hour dietary recall⁽⁹⁾. Another approach is analysis of food samples to determine energy and nutritional value. However, it is a time-consuming technique, especially in a large population. Biochemical assessment, for example serum albumin, can be measured to determine iron deficiency anemia⁽¹⁰⁾. This technique is accurate, but it is invasive and costly.

Questionnaires are assessment tools for food insecurity. In the Western countries, researchers have conducted qualitative research and developed instruments to measure food insecurity in various aspects to describe and monitor the situation. The Concern About Food Security was developed by Centers for Disease Control and Prevention⁽¹¹⁾, however, it consisted of the single statement with a dichotomous scale. The Household Food Security Questionnaire was constructed by the United States Department of Agriculture consisting of 18 items to assess different dimensions of food insecurity⁽¹²⁾. However, there is only one item that elicits data regarding concerns. Therefore, constructing and developing an instrument capturing associated domains is deemed necessary to more appropriately determine prevalence of food insecurity.

Material and Method

Design

This study was mixed methods research with exploratory design aimed for instrument development

including two phases, instrument development and instrument testing phases.

Phase 1: Instrument development

Instrument development was based on literature review and qualitative data eliciting experiences with food insecurity and problems about food among families living in slum areas. This phase included two major steps: item generation and pilot testing.

Step 1: Through purposive sampling, 30 participants were selected based on the following inclusion criteria: 1) female food providers of the families, 2) aged 18 years old or older, 3) had been living in urban slums in Bangkok for at least five years, and 4) be able to communicate in Thai. At the initial stage, literature review and in-depth interviews were conducted for description of food insecurity, item generation and scaling determination, followed by item review and face validity. The interview questions were developed. Each interview lasted 45-60 minutes. The interviews were audiotaped and transcribed verbatim. The data obtained were subsequently used to generate the 35-item Food Insecurity Screening instrument. The response items were arranged in a rating scale asking the participants to determine whether the events specified in the items had taken place in the past month and during the past 12-month. Food security could be assessed and classified into three levels including: Never (0 point) indicating a low level of food insecurity, Sometimes (1 point) indicating a moderate level of food insecurity, Often (2 points) indicating a high level of food insecurity. Reverse scoring was used with the items with opposite meaning. The total possible scores ranged from 0 to 70. Face validity was then conducted.

Step 2: The instrument was pilot tested. Convenience sampling was employed to recruit 50 participants who were not those participating in step 1 to pilot the instrument. The sample for pilot testing included family food providers who lived in the central northern, eastern, western, and southern slum areas of Bangkok, Thailand. The participants were asked to complete the questionnaire and reflect on the problems with the newly developed instrument so as to further revise and ensure clarity of the instrument.

Phase 2: Psychometric testing

The second phase was testing for psychometric properties including validity and reliability. Content validity was examined by five experts using the content validity index (CVI) as described by

Lynn⁽¹³⁾. Of these five experts, two were specialists in nutrition, one was a specialist in community health, one was an expert in public health economy, and one was an expert in instrument development.

Sample and setting

Through purposive sampling following the inclusion criteria as stated in Phase 1-Step 1, the sample of 350 from the five settings were recruited according to the principle of factor analysis^(14,15).

Data collection

In phase 1, the researchers conducted in-depth interviews following Interview Protocols: 1) How do you take care of food in the family? Where do you buy food from? How? 2) What do you think about food of the family? 3) What kinds of problems do you have when it comes to buying food for the family to eat? 4) What do you do with the food problems that have taken place? 5) What makes you concerned/anxious about food in the family? and 6) What helps you deal with problems? What makes the problems better? What makes the problems worse? After qualitative data analysis, 35 items were generated. Participants recruited in Step 2 completed the newly developed instrument for clarification and revision.

In phase 2, structured interviewed were conducted among the participants to elicit data regarding demographic characteristics and food insecurity using the revised version of the newly developed food insecurity screening instrument (FISI) and a widely used instrument, the food insecurity questionnaire developed by the United States Department of Agriculture⁽¹²⁾. The three-day food record was also employed.

Data analysis

Qualitative data were analyzed using content analysis. Audit trail and member check were conducted. The reliability of the instrument was determined by internal consistency analysis using Cronbach's alpha coefficient. Item analysis was also conducted according to Ferretich⁽¹⁶⁾. Criterion-related validity was confirmed using concurrent validity. The relationship between scores derived from the FISI and the food insecurity questionnaire⁽¹²⁾ was analyzed. The relationship between scores derived from the FISI and nutritional intake computed with the INMUCAL-Nutrients program⁽¹⁷⁾ was also analyzed for concurrent validity. Exploratory factor analysis using the principal factor method and Varimax rotation method were used to

determine construct validity of the newly developed instrument.

Ethical consideration

This study was approved by the Institutional Review Board on Research Involving Human Subjects, Faculty of Medicine, Ramathibodi Hospital. The study aims and information were explained to the participants in detail. Participation was voluntary. Written consents were obtained. Data were kept confidentiality and anonymity.

Results

Characteristics of sample

The sample had a mean age of 43.1±12.5 years, ranging from 18-75 years. Majority of the sample (74.6%) were married. While 10.5% were widowed, 7.9% were separated, 5.0% were divorced, and 2.0% were single. All were Buddhist. Sixty five percent had primary education, and 19.3% had no education. Approximately half (49.5%) were self employed, whereas 10.5% had no job or were housewives.

A panel of five experts was asked to validate the FISI. The content validity index (CVI) of the instrument was equal to 0.93. The concurrent validity of the instrument was described by association with the quantity of protein intake as recorded in the three-day food record. The analysis of the relationship between the scores derived from the FISI developed by the researchers and the acquired protein quantity showed a negative relationship between scores of food insecurity and the acquired protein quantity at a moderate level ($r = -0.625, p < 0.001$). The criterion-related validity of the FISI was examined using concurrent validity. First, the analysis of the relationship between the scores derived from the FISI developed by the researchers and the food insecurity questionnaire developed by the USDA revealed a strong relationship between both instruments ($r = 0.835, p < 0.001$).

As regards reliability of the FISI, the internal consistency analysis indicated that Cronbach's alpha coefficient of the instrument was equal to 0.947. The item analysis of score for each item was conducted. The mean scores ranged from 0.3971 to 1.6714 from the total score of 2. The item with the highest mean score was "There was no grown fruit or vegetable", and the item with the lowest mean score was "There was no fruit or vegetable".

The correlation coefficient (r) between scores of each item and the total score (item-total scale) should be equal to 0.4 or higher⁽¹⁶⁾. The results of the analysis

revealed that the correlation coefficients ranged from 0.078 to 0.790, most of which met the specified criteria, thus confirming that the items had internal consistency. However, there were four items whose correlation coefficient was lower than the criteria. They were “Eating colorful food or food with preservatives” ($r = 0.362$), “Eating snacks and crisps” ($r = 0.327$), “There was no fruit and vegetable from somewhere near home” ($r = 0.078$), and “There was no grown fruit or vegetable” ($r = 0.105$). Thus, the items with very low internal consistency were omitted, particularly “There was no fruit and vegetable from somewhere near home”, and “There was no grown fruit or vegetable”.

As for correlation coefficient (r) between scores of each item and the subscale (item-subscale), it should be equal to 0.5 or higher⁽¹⁶⁾. The correlation coefficients of item-subscale of the food anxiety aspect ranged from 0.439 to 0.918. There were four items whose correlation coefficient was lower than 0.5. They were “There was no fruit and vegetable from somewhere near home” ($r = 0.492$), “There was no grown fruit or vegetable” ($r = 0.439$), “Excluding necessary food” ($r = 0.469$), and “Eating snacks and crisps” ($r = 0.476$). However, correlation coefficients were close to 0.5, so the items were considered acceptable. Since most of the correlation coefficients of item-subscale of the food quantity aspect, food quality aspect, and food safety aspect were higher than 0.5, thus confirming that the internal consistency of the item-subscale.

Correlation coefficient (r) between scores of subscale and subscale (subscale-subscale) should be between 0.40 and 0.65⁽¹⁶⁾. The results of the analysis as shown in Table 1 indicated that the correlation coefficients between subscales of food anxiety and food quantity, food anxiety and food quality, food anxiety and food safety, food quantity and food safety, and food quality and food safety were in the acceptable range. There was only the correlation coefficient between the subscales of food quality and food quantity that was slightly lower than 0.4 ($r = 0.284$).

Correlation coefficient (r) between scores of subscales and the total score (subscale-total score) should be between 0.55 and 0.88⁽¹⁶⁾. The results of the analysis revealed that the correlation between the subscales and the total score of food anxiety and the total score, food quantity and the total score, food quality and the total score, and food safety and the total score were within the specified range. Therefore, there was good internal consistency between the subscales and the total score, as shown in Table 1.

In summary, the item analysis has revealed that correlation coefficient of the items “There was no fruit and vegetable from somewhere near home” ($r = 0.105$) and “There was no grown fruit or vegetable” ($r = 0.078$) were lower than the specified values to a great extent. Thus, they did not have appropriate internal consistency and were omitted from the screening instrument and excluded from the subsequent factor analysis.

Construct validity was determined by means of exploratory factor analysis using the principal factor method and Varimax rotation method. The data used in the analysis were derived from the 350 participants who took part in the second phase of the study who completed the newly developed 33-item food insecurity screening instrument.

Factor analysis revealed that there were four factors explaining 74.910% of the total variance of the newly developed food insecurity screening instrument. As shown in Table 2, there were four factors that had the Eigen value higher than 1. The first factor (food quantity) had the highest percentage of variance at 40.283%, meaning that the food quantity factor could explain 40.283% of the total variance. The percentages of variance of the second factor (food quality), the third factor (food safety), and the fourth factor (food anxiety) were 20.826%, 8.917%, and 4.884%, respectively. The cumulative of percentage of variance of all four factors of the food insecurity screening instrument was 79.910%.

Table 1. Correlation coefficient (r) of Subscale and Subscale, and Subscale and total scale ($n = 350$)

Scale	1	2	3	4	5
Food anxiety	1.000				
Food quantity	0.479*	1.000			
Food quality	0.675*	0.284*	1.000		
Food safety	0.506*	0.611*	0.544*	1.000	
Total scale	0.778*	0.765*	0.781*	0.829*	1.000

* $p < 0.01$

Factor 1 (9 items) had the highest percentage of variance at 40.283%. This means that this factor could explain the variance by 40.283% of the total variance. The factor loading ranged from 0.339 to 0.898, and the communalities were 0.638 to 0.874. There were seven items categorized in this factor: running out of food, having insufficient food, eating less than should, skipping some meals, feeling hungry but not eating, not eating for the whole day, and having food available all the times. This factor was termed ‘food quantity’.

Factor 2 (12 items) had the second highest percentage of variance at 20.826%. The factor loading ranged from 0.233 to 0.822, and the communalities were 0.691 to 0.956. There were 12 items categorized in this factor: not having all types of food, food having no value, not having necessary food, omitting necessary food, eating the same food repeatedly, eating leftover food from the night before, drinking alcoholic beverages, not having fresh food, not having fruit or vegetable, not having meat, not having rice, and eating instant noodle. This factor was termed ‘food quality.’

Factor 3 (9 items) had the percentage of variance of 8.917%. The factor loading ranged from 0.355 to 0.810, and the communalities were 0.549 to 0.854. There were nine items in this factor: buying food without checking expiration date, eating not properly cooked food, not having time to eat, washing fruit and vegetable before eating/cooking, eating/buying hot food, eating food with preservatives or bright coloring, eating snacks and crisps, eating food with monosodium glutamate, and eating packed ready-to-eat food. This factor was termed ‘food safety’.

Factor 4 (5 items) had the percentage of variance of 4.884%. The factor loading ranged from 0.282 to 0.696, and the communalities were 0.654 to 0.789. There were five items categorized in this factor: food not sufficient to eat, food not clean or safe, food not good enough, food running out, and not having food. This factor was termed ‘food anxiety’.

Table 3 shows the factor loadings and communalities. The analysis of the factors revealed that the classification of the 33 items of the food

insecurity screening instruments into four factors was as follows:

Factor 1: The factor loading ranged from 0.339 to 0.898, and the communalities were 0.638 to 0.874. There were seven items in this factor: running out of food, having insufficient food, eating less than should, skipping some meals, feeling hungry but not eating, not eating for the whole day, and having food available all the times, which reflected insufficient food quantity. Thus, this factor was termed ‘food quantity’.

Factor 2: The factor loading ranged from 0.233 to 0.822, and the communalities were 0.691 to 0.956. There were 12 items in this factor: not having all types of food, food having no value, not having necessary food, omitting necessary food, eating the same food repeatedly, eating left over food from the night before, drinking alcoholic beverages, not having fresh food, not having fruit or vegetable, not having meat, not having rice, and eating instant noodle, which reflected inappropriate types and quality of food. Therefore, this factor was termed ‘food quality’.

Factor 3: The factor loading ranged from 0.355 to 0.810, and the communalities were 0.549 to 0.854. There were nine items in this factor: buying food without checking expiration date, eating not properly cooked food, not having time to eat, washing fruit and vegetable before eating/cooking, eating/buying hot food, eating food with preservatives or bright coloring, eating snacks and crisps, eating food with monosodium glutamate, and eating packed ready-to-eat food, all of which reflected the safety of food. Therefore, this factor was termed ‘food safety’.

Factor 4: The factor loading ranged from 0.282 to 0.696, and the communalities were 0.654 to 0.789. There were five items in this factor: food not sufficient to eat, food not clean or safe, food not good enough, food running out, and not having food, which reflected anxiety about food. Thus, this factor was termed ‘food anxiety’.

Discussion

Results revealed that the 33-item food

Table 2. Eigen value of percentage of variance and cumulative percentage (n = 350)

Factor	Eigen value	% of variance	Cumulative %
Food quantity	13.293	40.283	40.283
Food quality	6.873	20.826	61.109
Food safety	2.943	8.917	70.026
Food anxiety	1.612	4.884	74.910

Table 3. Factor loadings and communalities (n = 350)

Statements	Factor loadings	Communalities
Food anxiety		
Food not sufficient to eat	0.416	0.762
Food not clean or safe	0.282	0.668
Food not good enough	0.696	0.654
Food running out	0.585	0.789
Not having food	0.652	0.727
Food quantity		
Running out of food	0.801	.814
Having insufficient food	0.895	0.874
Eating less than should	0.896	0.872
Skipping some meals	0.844	0.841
Feeling hungry but not eating	0.898	0.874
Not eating for the whole day	0.839	0.814
Having food available all the times	0.339	0.638
Food Quality		
Not having all types of food	0.271	0.927
Food having no value	0.822	0.771
Not having necessary food	0.801	0.837
Omitting necessary food	0.492	0.691
Eating the same food repeatedly	0.617	0.773
Eating leftover food from the night before	0.265	0.927
Drinking alcoholic beverages	0.233	0.723
Not having fresh food	0.686	0.808
Not having fruit or vegetable	0.779	0.741
Not having meat	0.657	0.785
Not having rice	0.267	0.956
Eating instant noodle	0.516	0.797
Food Safety		
Buying food without checking expiration date	0.808	0.824
Eating not properly cooked food	0.398	0.801
Eating not properly cooked food	0.387	0.788
Washing fruit and vegetable before eating/cooking	0.396	0.854
Eating/buying hot food	0.355	0.819
Eating food with preservatives or bright coloring	0.723	0.618
Eating snacks and crisps	0.697	0.670
Eating food with monosodium glutamate	0.810	0.833
Eating packed ready-to-eat food	0.491	0.549

insecurity screening instrument developed in this study had appropriate reliability, content validity, concurrent validity, and construct validity. According to Ferketich⁽¹⁶⁾, the acceptable reliability value of a newly developed instrument is at least 0.70. Cronbach's alpha correlation coefficient of the newly developed FISII was equal to 0.947, indicating that the instrument had an acceptable level of reliability. As a consequence, it could be concluded that the FISII had appropriate reliability. Regarding the item analysis, results revealed a strong internal consistency of the item-total scale, except for two statements which were deleted. The item-subscale,

subscale-subscale, and subscale-total scale analysis revealed that most of the items had a strong internal consistency. For those with low level of internal consistency, the values were still in an acceptable range, so they were not omitted, assuring adequate items.

There were five experts examining for content validity and the revised version were also reviewed. Four domains derived from content analysis of the in-depth interview data were consistent with results from the factor analysis including food quantity, food quality, food safety, and food anxiety. Criterion-related validity also assured that the instrument was sufficiently valid.

It is concluded that the psychometric properties tested in this study indicate that the FISI had adequate quality required for a new instrument for food insecurity screening.

Limitations of the study

The newly developed instrument had an acceptable value of validity and reliability. However, some of the findings did not meet the specified criteria, and the predictive validity of the instrument had not been examined or confirmed, thus resulting in a limitation of the instrument which should be further developed to ensure standardization.

Recommendations

The recommendations for implementation and further research could be made as follows:

1) The food insecurity screening instrument should be implemented with families in a slum area who are not the participants of the study so as to assess the problems with food insecurity and compare and contrast problems with food insecurity in different areas so as to lead to further guidelines to promote food security, food system, and health of the family and community.

2) Further studies should be conducted to confirm and further develop the quality of the food insecurity screening instrument. The cut-off point to identify problems with food insecurity should also be determined. Besides, in-depth studies, cross-sectional studies, and longitudinal studies should also be carried out to further develop the existing body of knowledge on food insecurity in different contexts and to generate more findings.

What is already known on this topic?

Food insecurity is a dynamic, global issue. A screening tool is needed to detect food insecurity in various populations and countries.

What this study adds?

A new screening tool for food insecurity was developed and tested for psychometric properties, providing a valid and reliable means of screening food insecurity in families and communities.

Acknowledgement

This study was funded by Mahidol University.

Potential conflicts of interest

None.

References

1. The International Food Policy Research Institute (IFPRI). 2013 Global food policy report [Internet]. 2014 [cited 2015 Dec 2]. Available from: <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/128043/filename/128254.pdf>
2. The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). Economic and social survey of Asia and the Pacific-2015: Making growth more inclusive for sustainable development [Internet]. 2015 [cited 2015 Dec 4]. Available from: <http://www.unescap.org/sites/default/files/Economic%20and%20Social%20Survey%20of%20Asia%20and%20the%20Pacific%202015.pdf>
3. Food and Agriculture Organization. The State of food insecurity in the world [Internet]. 2013 [cited 2015 Dec 4]. Available from: <http://www.fao.org/docrep/018/i3434e/i3434e.pdf>
4. National Economic and Social Development Board. The 11th National economic and social development plan (2012-2016) [Internet]. 2011 [cited 2015 Dec 2]. Available from: http://www.nesdb.go.th/Portals/0/news/plan/p11/Plan11_eng.pdf
5. World Bank. GINI index (World Bank estimate) [Internet]. 2013 [cited 2015 Dec 4]. Available from: <http://data.worldbank.org/indicator/SI.POV.GINI?page=1>
6. Piaseu N, Mitchell P. Household food insecurity among urban poor in Thailand. *J Nurs Scholarsh* 2004; 36: 115-21.
7. Piaseu N, Komindr S, Belza B. Understanding food insecurity among Thai older women in an urban community. *Health Care Women Int* 2010; 31: 1110-27.
8. Jones AD, Ngure FM, Pelto G, Young SL. What are we assessing when we measure food security? A compendium and review of current metrics. *Adv Nutr* 2013; 4: 481-505.
9. Block G. A review of validations of dietary assessment methods. *Am J Epidemiol* 1982; 115: 492-505.
10. Sauberlich HE, Skala JH, Dowdy RP. Laboratory tests for the assessment of nutritional status. Cleveland: CRC Press; 1974.
11. Centers for Disease Control and Prevention (CDC). Self-reported concern about food security—eight states, 1996-1998. *MMWR Morb Mortal Wkly Rep* 2000; 49: 933-6.
12. United States Department of Agriculture. Guide to

- measuring household food security [Internet]. 2000 [cited 2015 Dec 2]. Available from: <http://www.fns.usda.gov/sites/default/files/FSGuide.pdf>
13. Lynn MR. Determination and quantification of content validity. *Nurs Res* 1986; 35: 382-5.
 14. Dixon JK. Factor analysis. In: Munro BH, editor. *Statistical methods for health care research*. Philadelphia: Lippincott Williams & Wilkins; 2001: 303-29.
 15. Nunnally JC. *Psychometric theory*. 2nd ed. New York: McGraw-Hill; 1978.
 16. Ferketich S. Focus on psychometrics. Internal consistency estimates of reliability. *Res Nurs Health* 1990; 13: 437-40.
 17. Institute of Nutrition, Mahidol University. INMUCAL-Nutrient analysis program. Bangkok: Mahidol University; 2003.

การพัฒนาเครื่องมือคัดกรองความไม่มั่นคงทางอาหาร

นพวรรณ เปี้ยชื้อ, สุรัตน์ โคมินทร์, สุกัญญา ตันติประสพลาภ, ญัญญา สรนนต์ศรี, สุภร เจริญพานิช

ภูมิหลัง: ความไม่มั่นคงทางอาหารเป็นปัญหาสำคัญทั่วโลกในปัจจุบัน จึงมีความจำเป็นต้องพัฒนาเครื่องมือประเมินความไม่มั่นคงทางอาหารสำหรับกลุ่มประชากรที่หลากหลาย การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อพัฒนาและตรวจสอบคุณสมบัติ การวัดทางจิตวิทยาของเครื่องมือคัดกรองความไม่มั่นคงทางอาหาร

วัตถุประสงค์และวิธีการ: เครื่องมือคัดกรองความไม่มั่นคงทางอาหารในการศึกษาครั้งนี้ พัฒนาขึ้นจากการทบทวนวรรณกรรมและข้อมูลเชิงคุณภาพ จากสตรีจำนวน 30 คนที่เป็นผู้จัดการอาหารให้ครอบครัวที่อาศัยอยู่ในชุมชนแออัดเขตกรุงเทพมหานคร

ผลการศึกษา: เครื่องมือได้รับการตรวจสอบความตรงเชิงเนื้อหาจากผู้ทรงคุณวุฒิจำนวน 5 ท่าน มีดัชนีความตรงเชิงเนื้อหาที่ดี ได้รับการทดสอบในสตรีอีกกลุ่มหนึ่งที่เป็นผู้จัดการอาหารให้ครอบครัวจำนวน 350 คนพบว่า เครื่องมือมีความเที่ยงสูง การวิเคราะห์ห่ายข้อพบว่ามีความสอดคล้องภายในที่ดีระหว่างรายข้อและทั้งหมด ยกเว้น 2 ข้อความที่ต้องตัดออก การทดสอบความตรงเชิงโครงสร้างโดยการวิเคราะห์องค์ประกอบเชิงสำรวจ ประกอบด้วย 4 องค์ประกอบ 33 ข้อความ ได้แก่องค์ประกอบด้านปริมาณอาหาร คุณภาพอาหาร ความปลอดภัยของอาหาร และความวิตกกังวลเกี่ยวกับอาหาร องค์ประกอบทั้งหมดสามารถอธิบายความแปรปรวนได้ทั้งหมดร้อยละ 74.9

สรุป: เครื่องมือคัดกรองความไม่มั่นคงทางอาหารที่พัฒนาใหม่นี้มีความตรงและความเที่ยงในการคัดกรองความไม่มั่นคงทางอาหารในครอบครัวและชุมชน โดยผู้กำหนดนโยบายของประเทศเห็นประโยชน์และนำไปใช้ในการสำรวจระดับประเทศ นอกจากนี้ยังใช้ในการประเมินสถานการณ์ภายหลังน้ำท่วม