# Validity and Reliability of CHOICE Health Experience Questionnaire: Thai Version

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***Objective:*** *Assess the reliability and validity of the Thai translation of the CHOICE Health Experience Questionnaire (CHEQ), which is the English-language questionnaire, developed specifically for End-stage-renal disease (ESRD) patients. The CHEQ comprised of two parts, nine general domains of SF-36 (physical function, role-physical, bodily pain, mental health, role-emotional, social function, vitality, general health, and report transition) and 16 dialysis specific domains of the CHEQ (role-physical, mental health, general health, freedom, travel restriction, cognitive function, financial function, restriction diet and fluids, recreation, work, body image, symptoms, sex, sleep, access, and quality of life).*

***Material and Method:*** *The authors translated the CHEQ questionnaire into Thai and confirmed the accuracy by back translation. Pilot study sample was 10 Thai ESRD patients. Then the CHEQ (Thai) was applied to 110 Thai ESRD patients. Twenty-three patients had chronic peritoneal dialysis patients and 87 were chronic intermittent hemodialysis patients. Statistical analysis included descriptive statistics, Mann-Whitney U test, Student's t-test, and Cronbach's alpha.*

***Results:*** *Construct validity was satisfactory with the significant difference less than 0.001 between the low and high group. The reliability coefficient for the Cronbach's alpha of the total scale of the CHEQ (Thai) was 0.98. The Cronbach's alphas were greater than 0.7 for all domains, range from 0.58 to 0.92, except the social function and quality of life domain ($\alpha$ = 0.66 and 0.575).*

***Conclusion:*** *The CHEQ (Thai) is reliable and valid for assessment of Thai ESRD patients receiving chronic dialysis. Its properties are similar to those reported in the original version.*

***Keywords:*** *Kidney failure, Chronic, Quality of life, Questionnaires*

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End-stage-renal disease (ESRD) patients are among one of the fastest growing population almost everywhere including Thailand[1]. Data from 2003 Thailand registry of renal replacement therapy revealed the prevalence of ESRD in Thailand was 112.7 per million population[2]. The impact of renal failure and associated treatment on this group of patients will definitely diminish their overall well-being and functioning[3,4]. General qualities of life combined with dialysis-related quality of life (HRQOL) are important considerations in modifying clinical strategy and may improve patient condition and survival[5].

The Thai version of Medical Outcomes Study 36-Item Short Form Survey (SF-36) was translated earlier and proven to be a valuable tool in assessing medical outcomes and medical research in Thai patients with cardiac disease[6]. In the United States, the CHOICE Health Experience Questionnaire (CHEQ) was developed and proven valid and reliable as the specific instrument to measure HRQOL in ESRD patients. The CHEQ comprised of two parts, 9 general domains of SF-36 (physical function, role-physical, bodily pain, mental health, role-emotional, social function, vitality, general health, report transition)

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and 16 dialysis specific domains of the CHEQ (role-physical, mental health, general health, freedom, travel restriction, cognitive function, financial function, restriction diet and fluids, recreation, work, body image, symptoms, sex, sleep, access, quality of life)[7].

The aim of the present study was to translate the validated original CHEQ into Thai and assess the reliability and validity of CHEQ -Thai version (CHEQ (Thai)) in assessing quality of life of Thai ESRD patients receiving chronic dialysis therapy.

## Material and Method

### *Study design and subjects*

This was a single center (Siriraj Hospital, Mahidol University, Bangkok, Thailand), questionnaire validation study. Between April 2005 and October 2005, one hundred and ten ESRD patients were recruited from the outpatient nephrology clinic, chronic peritoneal dialysis clinic, and chronic hemodialysis unit.

The inclusion criteria were ESRD patients receiving chronic dialysis for more than 6 months who agreed and were capable of answering the questionnaire. The institutional ethical committee approved the present study, and all subjects provided written informed consent.

### *Translating CHEQ*

The original English CHEQ version was translated into Thai, first draft, by three nephrology staffs that were fluent in both languages. The difference in opinion of each nephrologist was reconciled in several organized meetings.

The maintaining of the original content of the questionnaire was confirmed by backward translation to English by Thai non-medical person who did not know the original English version. The different phrasings were identified by the nephrologists. The second draft of the translation was revised subsequently. The English re-back translation was performed. The process was repeated until the back translation draft was exactly the same as the original English CHEQ version. Nonetheless, there were some intentional exceptions due to cultural and/or environmental differences. The final translation, CHEQ (Thai), was completed by consensus of the nephrologists. The CHEQ (Thai) was administered to 10 ESRD patients. The nephrologists reviewed the final version of the CHEQ (Thai) after pilot testing. The enrolled 110 subjects completed the questionnaires.

### *Scoring*

The CHEQ (Thai) has two parts, the general health questions SF-36 and the ESRD specific health questions, composed of nine and 16 domains respectively. The SF-36 section contains 36 items. The ESRD specific health questions contain 46 items. The responses of each item were transformed by the simple linear regression according to the SF-36 scoring instructions[8]. This transformation converted the lowest and highest possible scores to 0 and 100 respectively. Scores between these values represented the percentage of the total possible score achieved. Missing values were excluded from the analysis.

### *Statistical analysis*

All analyses were conducted using SPSS version 13 (SPSS Inc.) Independent Student's *t*-test, and $\chi^2$ or Fisher's exact test were used to compare the mean value and proportional difference of sex, age, education, occupation, income, environment, role in the family, marital status, dialysis duration, amount of residual urine, dependency, income, education level, and the prevalence of diabetes mellitus (DM) and coronary artery disease (CAD) between hemodialysis (HD) and peritoneal dialysis (PD) patients who completed the CHEQ (Thai).

For reliability testing, the internal stability of the instrument was accessed by Cronbach's alpha. For validation analysis, discriminant power of the CHEQ (Thai) was analyzed by comparing the mean of the 27% of the two groups with independent Student's *t*-test and Mann-Whitney U-test. A p-value of less than 0.05 was considered statistical significant.

## Results

One hundred and ten ESRD patients, including 23 chronic peritoneal dialysis (PD) patients and 87 chronic hemodialysis patients completed the CHEQ (Thai). No patient refused to answer the questionnaire.

The frequency of demographic characteristics of the participants is summarized in Table 1 (demographic). In the hemodialysis group, the patients seem to be younger. Comparing with the HD group, higher proportion of patients in the PD group had DM (52% vs. 26%), CAD (33% vs. 18%) and residual urine more than 500 ml/day (35% vs. 17%), but a lower proportion of the patients in the PD group had a full time job (37% vs. 53%).

Results of internal consistency were satisfactory with Cronbach's alpha higher than 0.7 for all domains except social functioning ($\alpha$ = 0.66) and

**Table 1.** Demographic data

| | Mode of dialysis | | | | | |
|---|---|---|---|---|---|---|
| | PD (n = 23) | | HD (n = 87) | | Total (n = 110) | |
| | n | % | n | % | n | % |
| Sex | | | | | | |
| Female | 11 | 47.8 | 43 | 49.4 | 54 | 49.1 |
| Male | 12 | 52.2 | 44 | 50.6 | 56 | 50.9 |
| Mean age (years) | 61.39 | | 54.05 | | 55.58 | |
| Age Group | | | | | | |
| ≤ 65 | 14 | 60.9 | 66 | 75.9 | 80 | 72.7 |
| > 65 | 9 | 39.1 | 21 | 24.1 | 30 | 27.3 |
| Education | | | | | | |
| Less than bachelor degree | 15 | 71.4 | 70 | 81.4 | 85 | 79.4 |
| Bachelor degree or higher | 6 | 28.6 | 16 | 18.6 | 22 | 20.6 |
| Career | | | | | | |
| No career | 12 | 63.2 | 36 | 46.8 | 48 | 50.0 |
| Full time job | 7 | 36.8 | 41 | 53.2 | 48 | 50.0 |
| Income | | | | | | |
| ≤ 10000 baht/month | 9 | 56.3 | 48 | 60.0 | 57 | 59.4 |
| >10,00 baht/month | 7 | 43.8 | 32 | 40.0 | 39 | 40.6 |
| Marital status | | | | | | |
| Single | 2 | 8.7 | 16 | 18.4 | 18 | 16.4 |
| Married | 16 | 69.6 | 58 | 66.7 | 74 | 67.3 |
| Widow/Divorced | 5 | 21.7 | 13 | 14.9 | 18 | 16.4 |
| Own house | 20 | 87.0 | 57 | 65.5 | 20 | 18.2 |
| Family role: Head of Family | 6 | 26.1 | 37 | 42.5 | 44 | 40.0 |
| Dialysis duration | | | | | | |
| Less than 1 year | 9 | 39.1 | 17 | 19.8 | 26 | 23.9 |
| 1 to 3 years | 8 | 34.8 | 46 | 53.5 | 54 | 49.5 |
| More than 3 years | 6 | 26.1 | 23 | 26.7 | 29 | 26.6 |
| Residual urine | | | | | | |
| Residual urine < 500 cc/day | 15 | 65.2 | 70 | 83.3 | 85 | 79.4 |
| Residual urine ≥ 500 cc/day | 8 | 34.8 | 14 | 16.7 | 22 | 20.6 |
| Ambulation | | | | | | |
| Walk in | 9 | 39.1 | 40 | 46.0 | 49 | 44.5 |
| Need assistance | 14 | 60.9 | 47 | 54.0 | 61 | 55.5 |
| Coronary artery disease | 10 | 33.4 | 16 | 18.4 | 26 | 23.6 |
| DM | 12 | 52.1 | 23 | 26.4 | 35 | 31.9 |

PD = chronic peritoneal dialysis
HD = chronic hemodialysis

quality of life ($\alpha$ = 0.58) as shown in Table 2. By comparing the mean of the 27% of the two groups with independent *t*-test, all CHEQ domains were found to be significantly different at $p < 0.001$, as shown in Table 3.

The relationships of health status scales to clinical variables hypothesized to be related are listed in Table 4. Except in the SF-36 reported transition, and CHEQ domain of financial, restriction on diet and fluids, body image, sleep access, and quality of life, which showed no difference between the dialysis groups, the authors observed the higher score in every domain of HD group. The domains that had a significant lower score in the PD groups were physical function, role physical, role emotional, social function, vitality, SF-36 general health, CHEQ role-physical,

**Table 2.** Reliability

| Domain | Cronbach's alpha |
|---|---|
| SF-36 | |
| Physical function | 0.921 |
| Role-physical | 0.912 |
| Bodily pain | 0.788 |
| Mental health | 0.763 |
| Role-emotional | 0.886 |
| Social functioning | 0.660 |
| Vitality | 0.796 |
| General health | 0.749 |
| CHEQ | |
| Mental health | 0.788 |
| Freedom | 0766 |
| Cognitive functioning | 0.824 |
| Symptoms | 0.771 |
| Sex | 0.889 |
| Sleep | 0.820 |
| Access | 0.733 |
| Quality of life | 0.575 |

CHEQ general health, freedom, travel restrictions, cognitive function. Quality of life scores in those who did not have DM were higher in almost every domain except the SF-36 reported transition and CHEQ financial, body image, sex, and access domains. The patients with presence of coronary artery disease responded similarly to the patients with DM i.e. lower scores in most of the SF-36 and CHEQ part. The patients older than 65 years and those without a full time job also responded lower scores in all of the SF-36 domains and most of the CHEQ domains except the CHEQ body image and sex domain. In terms of financial aspect, the patients who had a monthly income higher than 10,000 baht, approximately US$250, provided higher quality of life scores consistently in every domain.

## Discussion

During the past century, dialysis techniques have been vitally developed for the ESRD patients.

**Table 3.** X, SD, and t-test between the low and high score group

| Domain | Mean ± SD | | p-value |
|---|---|---|---|
| | ≤27 percentile | ≥ 73 percentile | |
| SF-36 | | | |
| Physical function | 10.65 ± 9.11 | 83.59 ± 10.18 | <0.001[t] |
| Role physical | 0.00 ± 0.00 | 95.83 ± 9.48 | <0.001[M] |
| Bodily pain | 45.50 ± 11.02 | 97.10 ± 4.61 | <0.001[M] |
| Mental health | 41.94 ± 8.76 | 80.00 ± 7.84 | <0.001[t] |
| Role emotional | 0.00 ± 0.00 | 100.00 ± 0.00 | <0.001[M] |
| Social function | 41.25 ± 9.93 | 100.00 ± 0.01 | <0.001[M] |
| Vitality | 36.82 ± 9.67 | 74.39 ± 8.73 | <0.001[M] |
| General health | 18.33 ± 7.03 | 69.14 ± 7.72 | <0.001[t] |
| Reported transition | 22.86 ± 7.10 | 84.43 ± 12.23 | <0.001[M] |
| CHEQ | | | |
| Role-physical | 33.87 ± 16.52 | 100.00 ± 0.01 | <0.001[M] |
| Mental health | 45.07 ± 12.60 | 87.00 ± 7.47 | <0.001[M] |
| General health | 24.44 ± 14.43 | 100.00 ± 0.01 | <0.001[M] |
| Freedom | 26.31 ± 11.54 | 83.43 ± 13.65 | <0.001[t] |
| Travel restrictions | 28.85 ± 16.76 | 83.80 ± 12.03 | <0.001[M] |
| Cognitive function | 32.64 ± 8.04 | 89.09 ± 8.30 | <0.001[t] |
| Financial | 54.25 ± 26.80 | 100.00 ± 0.01 | <0.001[M] |
| Restriction on diet and fluids | 14.39 ± 12.55 | 81.67 ± 11.15 | <0.001[M] |
| Recreation | 36.90 ± 15.85 | 81.62 ± 11.11 | <0.001[M] |
| Work | 7.55 ± 11.46 | 100.00 ± 0.01 | <0.001[M] |
| Body image | 64.67 ± 17.14 | 100.00 ± 0.01 | <0.001[M] |
| Symptoms | 63.20 ± 8.91 | 91.26 ± 3.94 | <0.001[t] |
| Sex | 57.74 ± 19.63 | 100.00 ± 0.00 | <0.001[M] |
| Sleep | 28.28 ± 12.30 | 88.56 ± 7.85 | <0.001[M] |
| CHEQ access | 47.24 ± 19.14 | 100.00 ± 0.01 | <0.001[M] |
| CHEQ quality of life | 37.72 ± 12.67 | 83.10 ± 7.32 | <0.001[M] |

**Table 4.** Clinical and demographic characteristics associated with differences in specific quality-of-life domains

| | Mode of dialysis | | | Presence of DM | | | Presence of coronary artery disease | | | Age | | | Career | | | Income (baht/month) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PD | HD | p-value | No DM | DM | p-value | No CAD | CAD | p-value | ≤ 65 | > 65 | p-value | No career | Full time job | p-value | ≤ 10,000 | > 10,000 | p-value |
| | Mean | | | Mean | | | Mean | | | Mean | | | Mean | | | Mean | | |
| Physical function | 29 | 52 | 0.001 | 55 | 31 | <0.001 | 54 | 27 | <0.001 | 54 | 30 | <0.001 | 35 | 62 | <0.001 | 46 | 59 | <0.05 |
| Role physical | 17 | 37 | <0.05 | 37 | 26 | | 36 | 24 | | 36 | 24 | | 33 | 39 | | 25 | 49 | <0.05 |
| Bodily pain | 68 | 70 | | 71 | 66 | | 73 | 62 | <0.05 | 71 | 68 | | 66 | 77 | <0.05 | 67 | 78 | <0.05 |
| Mental health | 58 | 64 | | 63 | 62 | | 64 | 60 | | 63 | 62 | | 59 | 68 | <0.05 | 60 | 71 | 0.001 |
| Role emotional | 27 | 56 | <0.05 | 54 | 35 | 0.05 | 53 | 40 | | 51 | 47 | | 44 | 63 | <0.05 | 43 | 70 | <0.05 |
| Social function | 61 | 74 | <0.05 | 73 | 68 | | 74 | 63 | <0.05 | 72 | 70 | | 67 | 77 | <0.05 | 70 | 79 | <0.05 |
| Vitality | 49 | 57 | <0.05 | 57 | 51 | | 57 | 49 | <0.05 | 58 | 48 | <0.05 | 49 | 62 | <0.001 | 53 | 64 | 0.001 |
| General health | 38 | 46 | | 46 | 42 | | 45 | 41 | | 45 | 41 | | 38 | 52 | 0.001 | 43 | 50 | |
| Reported transition | 61 | 57 | | 56 | 60 | | 60 | 52 | | 59 | 56 | | 48 | 69 | <0.001 | 55 | 65 | |
| CHEQ role-physical | 59 | 77 | 0.001 | 82 | 49 | <0.001 | 79 | 57 | 0.001 | 81 | 52 | <0.001 | 61 | 84 | <0.001 | 72 | 82 | |
| CHEQ mental Health | 62 | 68 | | 68 | 64 | | 69 | 60 | <0.05 | 68 | 64 | | 62 | 73 | 0.001 | 64 | 75 | 0.001 |
| CHEQ general health | 47 | 68 | <0.05 | 65 | 64 | | 68 | 48 | <0.05 | 62 | 69 | | 63 | 66 | | 60 | 68 | |
| Fredom | 42 | 57 | <0.05 | 58 | 42 | <0.05 | 56 | 47 | | 57 | 45 | <0.05 | 45 | 63 | <0.001 | 50 | 62 | <0.05 |
| CHEQ travel restrictions | 51 | 68 | <0.05 | 71 | 45 | <0.001 | 67 | 57 | | 69 | 51 | <0.05 | 55 | 73 | <0.05 | 59 | 76 | <0.05 |
| CHEQ cognitive function | 47 | 66 | <0.001 | 63 | 59 | | 64 | 52 | <0.05 | 65 | 53 | <0.05 | 56 | 67 | <0.05 | 58 | 70 | <0.05 |
| CHEQ financial | 76 | 74 | | 73 | 74 | | 72 | 81 | | 72 | 81 | | 73 | 79 | | 63 | 89 | <0.001 |
| CHEQ restriction on diet and fluids | 64 | 55 | | 57 | 57 | | 56 | 59 | | 54 | 63 | | 58 | 61 | | 57 | 58 | |
| CHEQ recreation | 62 | 65 | | 67 | 63 | | 65 | 63 | | 67 | 58 | | 61 | 70 | | 62 | 71 | |
| CHEQ work | 57 | 67 | | 73 | 46 | <0.05 | 70 | 51 | <0.05 | 72 | 48 | <0.05 | 45 | 86 | <0.001 | 55 | 84 | <0.001 |
| CHEQ body image | 87 | 85 | | 82 | 89 | | 84 | 89 | | 84 | 88 | | 90 | 84 | <0.05 | 84 | 90 | |
| CHEQ symptoms | 78 | 80 | | 81 | 77 | | 81 | 73 | <0.05 | 80 | 77 | | 76 | 83 | <0.05 | 79 | 82 | |
| CHEQ sex | 83 | 89 | | 87 | 88 | | 88 | 87 | | 86 | 93 | | 90 | 88 | <0.05 | 89 | 89 | |
| CHEQ sleep | 64 | 61 | | 64 | 54 | | 65 | 53 | <0.05 | 65 | 53 | <0.05 | 53 | 72 | <0.001 | 58 | 72 | <0.05 |
| CHEQ access | 69 | 76 | | 75 | 77 | | 76 | 70 | | 75 | 74 | | 74 | 77 | | 76 | 75 | |
| CHEQ quality of life | 62 | 60 | | 63 | 55 | | 62 | 56 | | 60 | 61 | | 59 | 64 | | 58 | 68 | <0.05 |

This advancement has had a tremendous impact on the survival of ESRD patients[9]. Caring for chronic dialysis patients implies not only the management of dialysis apparatus and dialysis-related complication, but also the holistically well-being of the patients[10,11]. Outcomes other than survival, including quality of life, are also important to consider resource utilization and patient preferences for ESRD patient care[5]. The questionnaire is one of the best and most commonly used instruments to evaluate and study quality of life[8]. The increasing number of chronic dialysis population in Thailand has created a demand for translated instruments, primarily to enable comparison, monitoring, and aggregation of results across different treatment modality groups.

In the present study, the authors performed Thai language translation and validation of the functional assessment of the translated CHEQ, CHEQ (Thai). Many problems might occur during both the translation and validation process. Frequently, alterations in wording or content of the translated instruments are necessary to pass the validation process[12-15]. The unique characteristics of each language, environment, and way of life may pose a semantic difficulty. For instance, in translating the English version "walking one block" with the intention to access the exercise tolerance will not be accurate in Thailand. Our city plan is different and the distance between each building block varies. The authors decided to use the actual distance in meter and kilometer, which is quite familiar to layman Thai language instead. Another adjustment was changing "4 weeks" as in original English version to 1 month in the CHEQ (Thai). In piloting, these patients understood the terms very well and the accuracy of the meaning/ intention was maintained. Asian people usually feel reluctant to answer the question regarding sexual activity. Surprisingly, most of the presented patients answered it appropriately, there were only six patients who left all three items in the sex domain unanswered.

The reliability of the CHEQ (Thai) is comparable to the original CHEQ version[7]. The Cronbach's alphas of all domains were higher than 0.7, except in the social function (0.66) and CHEQ quality of life (0.57) domains. This observation was similar to the original CHEQ version, *i.e.* 0.66/0.76 and 0.57/0.68 for CHEQ (Thai)/original CHEQ respectively. These internal consistency levels, representing Cronbach's alpha, is comparable to the recent Asian data from Taiwan, alpha range 0.68-0.80[16]. All tests for validity, listed in the table discriminative index, show that the CHEQ (Thai) is suitable for evaluating quality of life in Thai dialysis patients.

In the presented dialysis population, the HD patient group had a higher score on three domains of SF-36 part (physical function, role-physical, and vitality), and five domains of CHEQ part (general health, traveling, and cognitive function). This better quality of life difference may be due to higher proportion of elderly in the PD group. PD patients will be limited with traveling as most of the presented patients use CAPD. A few patients who reported relative flexibility of traveling were those who were prescribed CCPD. The authors' finding is similar to a previous report that PD patients had the advantage on fluid and dietary restriction[7, 17].

It is understandable that the PD group with more proportion of elderly should inevitably feel less active, less able to do vigorous or even regular chores. The older patients in the PD group had more patients with DM and CAD. These two important comorbidities would result in a worse quality of life as previously described probably due to decreased energy, increase in complications, problems with pain and depression[18]. The most striking finding in the present study is the advantageous impact of higher income and the employment status on the quality of life. The patients who had full time jobs reported better quality of life in every domain except the body image and sex domains. One can imagine an active person with a PD catheter must have worried about their figure more than an inactive person staying at home. In Thailand dialysis is not provided to every citizen, the cost of dialysis obviously is one of the most important issues. The poor quality of life in patients with lower income is not unexpected and was previously described[19]. Even in the US, the change in Medicare reimbursement was one of the modality/methods to improve quality of care and outcomes[20].

**Conclusion**

In summary, we have described the translation, and adaptation of a well-known instrument for quality of life assessment in chronic dialysis patients, the CHEQ, for use in Thai dialysis patients.

The current study reports observations on the reliability, and the validity of the Thai translation of the CHEQ. The result suggested that this translation is well suited, valid and reliable for use in Thai dialysis population. We conclude that the CHEQ (Thai) is a useful index of co morbidity in Thai dialysis patients, and could be used in routine care.

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## *การแปลแบบทดสอบความเที่ยงตรงและความน่าเชื่อถือของแบบวัดคุณภาพชีวิตของผู้ป่วยไตวายเรื้อรังในคนไทย*

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***วัตถุประสงค์****: เพื่อให้มีแบบสอบถามที่เป็นเครื่องชี้วัดคุณภาพชีวิตอันเป็นที่ยอมรับสากลสำหรับผู้ป่วยด้วยโรคไตวายเรื้อรังสำหรับคนไทย*

***วัสดุและวิธีการ****: 1) ขอลิขสิทธิ์การแปลแบบสอบถาม CHEQ (CHOICE Health Experience Questionnaire) เป็นภาษาไทย 2) แพทย์เฉพาะทางโรคไต 3 ท่านแปล CHEQ เป็นภาษาไทย 3) นำแบบสอบถามที่ได้ไปให้ผู้เชี่ยวชาญทางด้านภาษาแปลกลับมาเป็นภาษาอังกฤษ (back translation) ให้ได้ข้อความที่คงความหมายเดียวกัน 4) นำแบบสอบถามให้ผู้ป่วยจำนวน 5-10 คนอ่านเพื่อค้นหาคำถามในแบบสอบถามที่ยังไม่ชัดเจน และปรับปรุงแบบสอบถามจนผู้ป่วยสามารถเข้าใจได้ดี 5) นำแบบสอบถามไปให้ผู้ป่วยกลุ่มตัวอย่างทำเพื่อทดสอบความเที่ยงตรง (reliability and validity) ของแบบสอบถาม*

***ผลการศึกษา****: แบบสอบถาม CHEQ ฉบับภาษาไทยที่ได้มีค่าความเที่ยงตรง และค่าความเชื่อมั่นสัมประสิทธิ์ครอนบาคอัลฟา (Cronbach's alphas) เป็นที่น่าพึงพอใจใกล้เคียงกับแบบสอบถามต้นฉบับ และสามารถนำมาประเมินคุณภาพชีวิตของผู้ป่วยไตวายเรื้อรังได้จริง*