



CHAPTER IV

RESULTS

The purpose of this study was to define the meaning of Quality of life in Thai patients with post MI, to test the psychometric properties of the Quality of life instrument in Thai patients with post Myocardial infarction including content validity, construct validity, Internal consistency reliability, criterion validity, and to find the norms of quality of life in Thai patients with post MI.

The results are organized in to two phases.

Phase1. There was the development of the quality of life instrument in Thai patients with post myocardial infarction in which in-dept interview and content analysis are used to discover the meaning and the construct of quality of life in Thai patients with post myocardial infarction. Generating the items, determining content validity and determination of appropriateness and clarity of the instrument are presented in this phase

Phase2. There was psychometric property testing of the Quality of Life Instrument in Thai Patients with Post Myocardial Infarction which demonstrated the evidence of validity and reliability.

Phase1: The QOL instrument in Thai patients with post MI was developed and had six themes as following:

1. Physical Capacity (PC = 8 items) was the ability to do activities without symptoms for normal living such as:
 - 1.1 Activity of daily living: eating, bathing, dressing, and personal hygiene

1.2 Routine work: house work such as rice cooking, cooking, washing
 plant watering, gardening, walking, exercising, and any
 routine activity

1.3 Role duty: job working, ability of working, traveling, social activity,

2. Physical health (PH = 16 items) is physical status which has no symptom
 or any sign of disease and any dangerous complication but maintenance of
 good health

2.1 Symptom and Complication of heart disease such as:

Symptom: chest pain, difficult breathing, tired, fatigue, fainting

Complication: swelling legs, rapid heart beat, cannot lie flat

2.2 Adapted Activity of Daily Living such as following the health care
 plan of the health team, proper food intake for heart disease, avoid the
 stimulants of heart symptoms, and be careful in living

3. Psychological comfort (PC = 14 items) is the psychological status which
 has no stress from disease, but have satisfaction and happiness for doing
 the favor activities including ability to living happily according to his role
 model
4. Economic stability (ES = 9 items) is the status of enough money for daily
 expenses with happy life, for the cost of treatment and for all members in
 his family to live.
5. Family Tie and social engagement (FTSE = 14 items) is the good relation
 with in or/and between or/and among family, friends and society.
6. Spiritual health (SH = 7 items) is the status which have peace in mind, self
 control, empower, value, and hope including practices according to his
 belief and religion.

Table 9 The internal consistency reliability by Cronbach's coefficient alpha of three instruments used in the study (N = 30)

| Item Statement | Cronbach's coefficient alpha |
|---|------------------------------|
| The Thai Post MI Quality of life Questionnaire | 0.928 |
| The SF36 | 0.926 |
| The MacNew Health Related Quality of life Questionnaire | 0.936 |

From Table9, It was present the internal consistency reliability by Cronbach's coefficient alpha of five instruments which were used in this study. It was the results from pretest by 30 participants. The Cronbach's coefficient alpha of SF36 = 0.926, the MacNew HRQOL = 0.936, and the TQOL = 0.928. A pretest is a trial run of a measure that under taken to provide information and reveal problems relating to its content, administration and scoring. The normal range of coefficient alpha values is between .00 and +1.00. Higher values of coefficient alpha reflect a higher internal consistency (Polit & Beck, 2004:420).

Table 10. Demographic characteristic of the 526 participants in phase2.

| Demographic Characteristic | Frequency | Percent |
|-------------------------------|-----------|---------|
| Age (Range from 28-90) | | |
| 28-40 | 16 | 3.04 |
| 41-53 | 121 | 23.00 |
| 54-66 | 225 | 42.78 |
| 67-79 | 147 | 27.95 |
| 80-90 | 17 | 3.23 |
| Sex | | |
| Male | 356 | 67.7 |
| Female | 170 | 32.3 |
| Marital Status | | |
| Marriage | 393 | 74.7 |
| Single | 29 | 5.5 |
| Widow | 79 | 15.0 |
| Divorce/separate | 25 | 4.8 |
| Region | | |
| Buddhism | 498 | 94.7 |
| Christ | 7 | 1.3 |
| Islam | 21 | 4.0 |
| Education | | |
| Primary school | 244 | 46.4 |
| Secondary school | 101 | 19.2 |
| Diploma | 52 | 9.9 |
| Bachelors and more | 85 | 16.2 |
| Other (no education, Master) | 44 | 8.4 |
| Occupation | | |
| Employee | 100 | 19.0 |
| Farmer | 56 | 10.6 |
| Business | 64 | 12.2 |
| Government officer | 91 | 17.3 |
| House work/ not working | 141 | 26.8 |
| Retirement | 74 | 14.1 |

Table 10 (continued)

| Demographic and Characteristic | Frequency | Percent |
|--------------------------------|-----------|---------|
| Occupational status | | |
| Full time | 188 | 35.7 |
| Part-time | 119 | 22.6 |
| Not work | 219 | 41.6 |
| Incomes/month | | |
| 5,000 and less baht | 193 | 36.7 |
| 5,001-10,000 baht | 118 | 22.4 |
| 10,001-15,000 baht | 76 | 14.4 |
| 15,001-20,000 baht | 42 | 8.0 |
| 20,001 baht and more | 97 | 18.4 |
| Economic status | | |
| Enough | 384 | 73.0 |
| Not enough | 142 | 27.0 |
| Duration of illness | | |
| 2-6 months | 179 | 34.0 |
| 7-12 months | 125 | 23.8 |
| 13-24 months | 116 | 22.0 |
| 25-36 months | 34 | 6.5 |
| 37-48 months | 20 | 3.8 |
| 49 months and more | 52 | 9.9 |
| Other disease | | |
| No other disease | 252 | 47.9 |
| Have other disease | 274 | 52.1 |
| Treatment | | |
| Medicine | 234 | 44.5 |
| Medicine and intervention | 292 | 55.5 |
| Hospital/Institute | | |
| Siriraj | 31 | 5.9 |
| Ramathibodi | 68 | 12.9 |

Table 10 (continued)

| Demographic and Characteristic | Frequency | Percent |
|--------------------------------|-----------|---------|
| Hospital/Institute | | |
| King Chulalongkorn Memorial | 75 | 14.3 |
| Pramongkuitkloa | 21 | 4.0 |
| Bhumipol | 39 | 7.4 |
| Rajvithei | 36 | 6.8 |
| Vachirapayabarn | 31 | 5.9 |
| Chest Disease Institute | 89 | 16.9 |
| Maharaj Chiangmai | 52 | 9.9 |
| Prince Songklanakarin | 37 | 7.0 |
| Khon Khan | 47 | 8.9 |

From Table 10, it presented demographic and characteristic, frequency, and percent of the participants in phase2. psychometric testing of the QOL instrument in Thai patients with post MI.

The participant's age ranged from 28-90 years with a mean of 60.67 (SD= 107.35). The majority of participants were male (67.7%), marriage (74.7%), and Buddhism (94.7%). Educational background of participants was at various levels: primary level (46.4%), secondary and bachelor levels were the second and third. All participants were distributed in various status of working: not working (26.8%), employee (19.0%), and government officers (17.3%). the incomes were varying from 5,000-20,000 baht per month which were enough for living (73.0%). Most of the participants have got disease at the range of two to six months (34.03%), seven to twelve months (23.77%) and thirteen to twenty four months (22.05%). They were treated with both medicine and intervention (52.1%). Half of the participants had other disease such as Hypertension, Diabetes Mellitus, and Hyperlipidemia which were the first three diseases founded in theses group of participants. Data were

collected from eleven hospitals with the number of the participants closely in each hospitals (ranged from 4.0% to 9.9%) except Chest Disease Institute, King Chulalongkorn Memorial Hospital, and Ramathibodi Hospital which were quite dominant in the amount of the participants (Ranged from 12.9% to 16.9%).

Construct validity

Factor analysis is a useful approach to assessing the construct validity when the investigator has designed, on the basis of conceptual framework, a measure to assess various dimensions or subcomponents of a phenomenon of interest and wishes to empirically justify these dimensions or factors (Waltz, Strickland & Lenz, 2005).

To develop a new instrument, item evaluation is the important step to evaluate the performance of the individual items so that appropriate ones can be identified to constitute the scale (DeVellis, 1991). Before testing the items of the instrument, the items of the instrument were evaluated univariate and multivariate characteristics of each item, to determine the items that should be eliminated before further analysis, factor analysis (Dixon, 2001:308). The first univariate descriptive statistic was performed to present four basic characteristics of distribution: central tendency, variability, skewness, and kurtosis which were presented in Table 4. All 62 items were tested the normal distribution by skewness and kurtosis; skewness represents symmetry of the distribution, and kurtosis reveals distribution peak.

The skewness for a normal distribution is zero, and any symmetric data should have a skewness near zero. Negative values for the skewness indicate data that are skewed left and positive values for the skewness indicate data that are skewed right. By skewed left, we mean that the left tail is long relative to the right tail. Similarly, right skewness means that the right tail is long relative to the left tail. Some

measurements have a lower bound and are skewed right. The standard normal distribution has a kurtosis of zero. Positive kurtosis indicates a "peaked" distribution and negative kurtosis indicates a "flat" distribution (Burn & Groove, 2001; Munro, 2001).

Table 11 Descriptive statistics of the Thai quality of life instrument (N = 526)

| Item Number | Mean | Median | Mode | SD | Skewness | Kurtosis |
|-------------|------|--------|------|-------|----------|----------|
| TQOL1 | 4.09 | 5.00 | 5 | 1.170 | -1.227 | 0.621 |
| TQOL2 | 3.55 | 4.00 | 4 | 1.195 | -0.422 | -0.764 |
| TQOL3 | 3.13 | 3.00 | 5 | 1.481 | -0.142 | -1.368 |
| TQOL4 | 3.08 | 3.00 | 5 | 1.478 | -0.073 | -1.401 |
| TQOL5 | 3.76 | 4.00 | 5 | 1.368 | -0.849 | -0.542 |
| TQOL6 | 4.37 | 5.00 | 5 | 1.172 | -1.944 | 2.661 |
| TQOL7 | 3.99 | 4.00 | 5 | 1.009 | -0.647 | -0.370 |
| TQOL8 | 4.15 | 5.00 | 5 | 1.011 | -0.979 | 0.182 |
| TQOL9 | 3.72 | 4.00 | 3 | 1.041 | -0.360 | -0.601 |
| TQOL10 | 3.86 | 4.00 | 5 | 1.024 | -0.493 | -0.557 |
| TQOL11 | 4.31 | 5.00 | 5 | 0.968 | -1.167 | 0.333 |
| TQOL12 | 4.27 | 5.00 | 5 | 0.970 | -1.157 | 0.454 |
| TQOL13 | 4.42 | 5.00 | 5 | 0.928 | -1.555 | 1.541 |
| TQOL14 | 4.10 | 4.00 | 5 | 0.943 | -0.636 | -0.671 |
| TQOL15 | 3.55 | 4.00 | 4 | 1.137 | -0.602 | -0.365 |
| TQOL16 | 3.67 | 4.00 | 5 | 1.423 | -0.777 | -0.714 |
| TQOL17 | 3.91 | 4.00 | 5 | 1.241 | -0.999 | -0.022 |
| TQOL18 | 2.94 | 3.00 | 1 | 1.452 | 0.051 | -1.335 |
| TQOL19 | 4.36 | 5.00 | 5 | 1.070 | -1.837 | 2.680 |
| TQOL20 | 3.98 | 4.00 | 5 | 1.113 | -1.007 | 0.280 |
| TQOL21 | 3.76 | 4.00 | 4 | 1.129 | -0.771 | -0.093 |
| TQOL22 | 3.87 | 4.00 | 5 | 1.143 | -0.903 | 0.075 |
| TQOL23 | 3.66 | 4.00 | 4 | 1.156 | -0.694 | -0.255 |
| TQOL24 | 4.08 | 4.00 | 5 | 0.899 | -0.813 | 0.444 |
| TQOL25 | 3.98 | 4.00 | 4 | 0.890 | -0.751 | 0.491 |
| TQOL26 | 4.29 | 4.00 | 5 | 0.784 | -0.947 | 0.638 |
| TQOL27 | 3.31 | 3.00 | 3 | 1.224 | -0.206 | -0.807 |
| TQOL28 | 3.95 | 4.00 | 5 | 1.103 | -0.844 | -0.033 |
| TQOL29 | 3.50 | 4.00 | 5 | 1.300 | -0.470 | -0.847 |
| TQOL30 | 3.34 | 3.00 | 3 | 1.276 | -0.264 | -0.954 |
| TQOL31 | 3.27 | 3.00 | 5 | 1.393 | -0.251 | -1.174 |
| TQOL32 | 3.52 | 4.00 | 3 | 1.134 | -0.429 | -0.471 |
| TQOL33 | 3.83 | 4.00 | 4 | 0.926 | -0.543 | 0.156 |
| TQOL34 | 3.88 | 4.00 | 4 | 0.988 | -0.766 | 0.256 |
| TQOL35 | 4.01 | 4.00 | 5 | 1.137 | -0.994 | 0.134 |
| TQOL36 | 4.02 | 4.00 | 5 | 1.036 | -1.040 | 0.671 |
| TQOL37 | 3.88 | 4.00 | 5 | 1.231 | -0.835 | -0.402 |
| TQOL38 | 3.42 | 4.00 | 4 | 1.330 | -0.494 | -0.879 |
| TQOL39 | 3.54 | 4.00 | 5 | 1.268 | -0.506 | -0.725 |
| TQOL40 | 3.46 | 3.00 | 3 | 1.144 | -0.288 | -0.492 |
| TQOL41 | 3.38 | 3.00 | 3 | 1.212 | -0.295 | -0.678 |
| TQOL42 | 3.40 | 3.00 | 3 | 1.163 | -0.243 | -0.615 |

Table 11 (continued)

| Item Number | Mean | Median | Mode | SD | Skewness | Kurtosis |
|-------------|------|--------|------|-------|----------|----------|
| TQOL43 | 3.61 | 4.00 | 5 | 1.267 | -0.432 | -0.954 |
| TQOL44 | 3.55 | 4.00 | 5 | 1.267 | -0.428 | -0.833 |
| TQOL45 | 3.33 | 3.00 | 3 | 1.202 | -0.325 | -0.612 |
| TQOL46 | 4.08 | 4.00 | 5 | 0.953 | -0.868 | 0.417 |
| TQOL47 | 4.03 | 4.00 | 5 | 0.993 | -0.917 | 0.425 |
| TQOL48 | 4.19 | 4.00 | 5 | 0.926 | -1.087 | 0.831 |
| TQOL49 | 3.64 | 4.00 | 4 | 1.162 | -0.585 | -0.423 |
| TQOL50 | 3.77 | 4.00 | 4 | 1.022 | -0.541 | -0.209 |
| TQOL51 | 3.90 | 4.00 | 4 | 0.853 | -0.497 | 0.049 |
| TQOL52 | 3.73 | 4.00 | 4 | 1.030 | -0.526 | -0.237 |
| TQOL53 | 3.63 | 4.00 | 4 | 1.044 | -0.387 | -0.458 |
| TQOL54 | 3.70 | 4.00 | 4 | 1.121 | -0.618 | -0.258 |
| TQOL55 | 4.07 | 4.00 | 5 | 0.946 | -0.951 | 0.620 |
| TQOL56 | 3.36 | 3.00 | 3 | 1.199 | -0.239 | -0.811 |
| TQOL57 | 3.73 | 4.00 | 4 | 0.988 | -0.421 | -0.288 |
| TQOL58 | 3.88 | 4.00 | 4 | 0.948 | -0.595 | -0.037 |
| TQOL59 | 3.54 | 4.00 | 5 | 1.28 | -0.535 | -0.729 |
| TQOL60 | 3.92 | 4.00 | 4 | 0.967 | -0.767 | 0.344 |
| TQOL61 | 4.04 | 4.00 | 4 | 0.918 | -0.739 | 0.150 |
| TQOL62 | 4.37 | 5.00 | 5 | 0.857 | -1.451 | 2.061 |

From Table 11, the 62 items of TPMIQOL questionnaire were presented with their means medians, mode, skewness, and kurtosis to test for normally distribution. The item means ranged from 2.94-4.37, standard deviation ranged from .784-1.48. Skewness ranged from 0.05 to -1.94. Kurtosis ranged from -0.022 to 2.680

Testing the item statement discrimination

The good items should discriminate the measure between the high scores group and the low score group. The 25% of the high scores group and the 25% of the low scores group of the 526 participants (132 participants for each group)) was bring out and compared each item scores of theses two group by paired t-test. The result demonstrated that each item was able to discriminate the mater it's measure of quality of life. The result was presented in Table 12.

Table 12 The result of 62 item discrimination of TQOL by pair t-test comparison

(N = 132)

| Item | Mean | SD | t | p < .05 Sig (2-tailed) |
|--------------|----------|---------|---------|---------------------------|
| Pair TQOL 1 | -1.32576 | 1.22004 | -12.485 | .000 |
| Pair TQOL 2 | -1.07576 | 1.62340 | -7.613 | .000 |
| Pair TQOL 3 | -1.52273 | 1.97490 | -8.859 | .000 |
| Pair TQOL 4 | -1.42424 | 1.89060 | -8.655 | .000 |
| Pair TQOL 5 | -1.67424 | 1.33363 | -14.423 | .000 |
| Pair TQOL 6 | -1.37121 | 1.42178 | -11.081 | .000 |
| Pair TQOL 7 | -1.28788 | 1.12928 | -13.103 | .000 |
| Pair TQOL 8 | -1.28030 | 1.11420 | -13.202 | .000 |
| Pair TQOL 9 | -1.35606 | 1.24258 | -12.538 | .000 |
| Pair TQOL 10 | -1.43182 | 1.12020 | -14.685 | .000 |
| Pair TQOL 11 | -1.19697 | 1.18153 | -11.639 | .000 |
| Pair TQOL 12 | -1.18939 | 1.07101 | -12.759 | .000 |
| Pair TQOL 13 | -.80303 | 1.13541 | -8.126 | .000 |
| Pair TQOL 14 | -1.12879 | 1.08709 | -11.930 | .000 |
| Pair TQOL 15 | -1.08333 | 1.38168 | -9.008 | .000 |
| Pair TQOL 16 | -1.90909 | 1.52563 | -14.377 | .000 |
| Pair TQOL 17 | -1.56818 | 1.43667 | -12.541 | .000 |
| Pair TQOL 18 | -1.72727 | 1.75652 | -11.298 | .000 |
| Pair TQOL 19 | -1.18182 | 1.25897 | -10.785 | .000 |
| Pair TQOL 20 | -1.31061 | 1.43635 | -10.483 | .000 |
| Pair TQOL 21 | -1.28030 | 1.50477 | -9.775 | .000 |
| Pair TQOL 22 | -1.15909 | 1.41868 | -9.387 | .000 |
| Pair TQOL 23 | -1.43939 | 1.36061 | -12.154 | .000 |
| Pair TQOL 24 | -1.42424 | 1.04933 | -15.594 | .000 |
| Pair TQOL 25 | -1.02273 | 1.15558 | -10.168 | .000 |
| Pair TQOL 26 | -.81061 | 1.16653 | -7.984 | .000 |
| Pair TQOL 27 | -1.42424 | 1.54387 | -10.599 | .000 |
| Pair TQOL 28 | -1.89394 | 1.12743 | -19.300 | .000 |
| Pair TQOL 29 | -1.89394 | 1.52964 | -14.225 | .000 |
| Pair TQOL 30 | -1.66667 | 1.41781 | -13.506 | .000 |
| Pair TQOL 31 | -1.45455 | 1.71372 | -9.752 | .000 |
| Pair TQOL 32 | -1.31061 | 1.45745 | -10.332 | .000 |
| Pair TQOL 33 | -1.35606 | 1.07811 | -14.451 | .000 |
| Pair TQOL 34 | -1.53030 | 1.14211 | -15.394 | .000 |
| Pair TQOL 35 | -1.79545 | 1.18990 | -17.336 | .000 |
| Pair TQOL 36 | -1.50758 | 1.16891 | -14.818 | .000 |
| Pair TQOL 37 | -1.97727 | 1.25075 | -18.163 | .000 |
| Pair TQOL 38 | -1.73485 | 1.42422 | .12396 | .000 |
| Pair TQOL 39 | -1.98485 | 1.26603 | -18.012 | .000 |
| Pair TQOL 40 | -1.90909 | 1.21350 | -18.075 | .000 |

Table 12 (continued)

| Item | Mean | SD | t | p < .05 Sig (2-tailed) |
|--------------|----------|---------|---------|---------------------------|
| Pair TQOL 41 | -1.76515 | 1.32998 | -15.248 | .000 |
| Pair TQOL 42 | -1.63636 | 1.29162 | -14.556 | .000 |
| Pair TQOL 43 | -1.01515 | 1.65306 | -7.056 | .000 |
| Pair TQOL 44 | -1.24242 | 1.73038 | -8.249 | .000 |
| Pair TQOL 45 | -1.81061 | 1.26692 | -16.420 | .000 |
| Pair TQOL 46 | -1.34091 | 1.05447 | -14.610 | .000 |
| Pair TQOL 47 | -1.28788 | 1.19497 | -12.382 | .000 |
| Pair TQOL 48 | -1.30303 | 1.11163 | -13.467 | .000 |
| Pair TQOL 49 | -1.64394 | 1.30841 | -14.435 | .000 |
| Pair TQOL 50 | -1.54545 | 1.12815 | -15.739 | .000 |
| Pair TQOL 51 | -1.28030 | 1.02126 | -14.403 | .000 |
| Pair TQOL 52 | -1.48485 | 1.29877 | -13.135 | .000 |
| Pair TQOL 53 | -1.51515 | 1.17535 | -14.811 | .000 |
| Pair TQOL 54 | -1.58333 | 1.18542 | -15.346 | .000 |
| Pair TQOL 55 | -1.44697 | 1.14794 | -14.482 | .000 |
| Pair TQOL 56 | -1.48485 | 1.55551 | -10.967 | .000 |
| Pair TQOL 57 | -1.64394 | 1.07101 | -17.635 | .000 |
| Pair TQOL 58 | -1.04545 | 1.27730 | -9.404 | .000 |
| Pair TQOL 59 | -.37879 | 1.96352 | -2.216 | .028 |
| Pair TQOL 60 | -.90909 | 1.39494 | -7.488 | .000 |
| Pair TQOL 61 | -1.03788 | 1.20688 | -9.880 | .000 |
| Pair TQOL 62 | -1.00758 | 1.12227 | -10.31 | .000 |

P < .05 df = 131 N = 132

TQOL = Thai quality of life instrument in post myocardial infarction

Table 12 was presented the pairs mean comparison of 62 items of TQOL. The result demonstrated the significance of discrimination of each item in the TQOL instrument. At this point, it meant that all 62 items of the QOL instrument were able to discriminate the high score group and the low score group of quality of life measurement. They were able to measure quality of life in Thai patients with post myocardial infarction. After that, these data were tested for the construct of QOL instrument by factor analysis method.

Factor analysis

Factor analysis is a statistical tool for analyzing scores on large numbers of variables to determine whether there are any identifiable dimensions that can be used to describe many of the variables under study. It is often used to test the validity of ideas about items so the researcher can decide how items should be group together into each factor and how many factors should be the construct of the instrument. by which items should be dropped from the instrument entirely Munro, 2001: 306-307). Data were collected from 526 participants. Before starting to test factor analysis, it should be evaluated the assumptions of using factor analysis method. The data were evaluated about the correlation of variables, Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett test of Sphericity for the 62 items of the TQOL was tested by 526 participants.

KMO is a ratio of sum of squared correlations to the sum of squared correlation plus sum of squared partial correlation. It can indicate variables share common factors by comparing the zero-order correlation to the partial correlations. When KMO is .60 and above, it reveals that using factor analysis is suitable. The KMO of this study was .927 and suited to conduct factor analysis.

Bartlett test of Sphericity is statistical testing to examine the overall correlation matrix and is appropriate for factor analysis by testing the hypothesis that the matrix is an identity matrix, and also providing determination of multivariate normal distribution (Hair, et al., 1998: 99), Dixon, 2001: 324). In this study, the Bartlett test of Sphericity was significant ($\chi^2 = 17584.76$, $df = 1891$, $p = .000$), revealing that variables had multivariate normal distribution, and the correlation matrix was suitable for factor analysis.

Item analysis is a systematic evaluation of individual items. The correlation of item to item of the TQOL instrument was done by Pearson Correlation matrix. Item mean of TQOL instrument ranged from 2.943 to 4.424, and item variance ranged from .614 to 2.193. Item to item correlation ranged from -.093 to .831 and most of them were significant $p < .01$ and .001, item to total correlation ranged from .074 to .62.

Exploratory Factor analysis (EFA) was done to find the construct of the TQOL instrument. In the process of EFA, the principal component method of factor analysis for extraction was chosen to set a group of correlated items to be a factor. The criteria used to extract items were eigenvalues greater than 1 and factor loading cutoff point was .5 (DeVellis, 1991: 104). Twenty 17 items were extract from 62 items of the TQOL instrument so that the final construct of TQOL instrument had 45 items in 9 factors. These 45 items of TQOL instrument were able to explain the quality of life with the 56.70 % of variance. The construct of TQOL instrument, factor loading, and Communalities were presented in Figure8, Tables8, 9. and Figure9 presented the scree plot of the component number and eigenvalue of the quality of life instrument.

Table 13 Item statement of TQOL instrument, factor loadings, and communalities

| Item Statement | Factor | |
|--|----------|---------------|
| | Loadings | Communalities |
| Factor1. Symptom & Complication (7 items) | | |
| 7. You have chest pain | .784 | .696 |
| 8. You have difficult breathing | .809 | .721 |
| 9. You are tired | .784 | .717 |
| 10. You are fatigue and weak | .754 | .689 |
| 11. You are light-headed or faint | .620 | .510 |
| 12. You feel tired and can not breathing when lying down | .728 | .609 |
| 14. You have irregular heart beats | .655 | .475 |
| Factor2. Psychological Comfort (6 items) | | |
| 27. You have anxiety about disease which is unable to be treated | .728 | .610 |
| 28. You feel discourage in your life | .613 | .655 |
| 29. You feel sad to have heart disease | .770 | .681 |
| 30. You are fear about symptom suffering from increasing severity of the disease | .811 | .722 |
| 31. You are fear about death due to delay treatment | .773 | .665 |
| 56. You feel unstable life after you have heart disease | .545 | .487 |

Table 13 (continued)

| | Item Statement | Factor Loadings | Communalities |
|---------------------------------------|--|-----------------|---------------|
| Factor3. Family Tie (5 items) | | | |
| 46. | You have a warm family | .805 | .815 |
| 47. | You have children or couple or family members to helping and caring you | .832 | .801 |
| 48. | You have to be concerned and cared from your family | .787 | .792 |
| 49. | You join in your family activities: eating food, traveling, shopping | .554 | .627 |
| 62. | You are happy to live with your children, couple or family as long as even though you have heart disease | .572 | .604 |
| Factor4. Adapted ADL (6 items) | | | |
| 15. | You can control diet properly for heart disease: low salt or low cholesterol diet | .598 | .541 |
| 19. | You can take medicine each meal correctly and regularly | .592 | .589 |
| 20. | You can sleep 6-8 hours per day | .570 | .573 |
| 21. | You can take care yourself correctly and properly for your heart disease by study about it | .769 | .663 |
| 22. | You live with carefully without any dangerous for your life: don't do heavy energetic work or don't go to a place which without promptly treatment for heart disease | .758 | .641 |
| 23. | You avoid from any stimulant for your heart problems: over glad or sad or stress | .708 | .618 |

Table 13 (continued)

| | Item Statement | Factor Loadings | Communalities |
|---|---|-----------------|---------------|
| Factors5. Economic Stability (4 items) | | | |
| 39. | You have permanently income from working or your closed relatives | .595 | .648 |
| 40. | You have enough money for your living expenses | .725 | .769 |
| 41. | You have enough money for treatment expenses | .820 | .826 |
| 42. | You have enough money for going to receive treatment from the hospital: expense for traveling, resident, food etc. | .796 | .799 |
| Factor6. Spiritual Health (4 items) | | | |
| 58. | You feel psychological comfort when reading or listening to your religion wording | .814 | .746 |
| 59. | You belief that your illness is a planned life and planned before | .650 | .521 |
| 60. | You are happy when you prayer or worship or intone | .850 | .769 |
| 61. | You live along with your religion doctrine | .812 | .760 |
| Factors7. Social Engagement (5 items) | | | |
| 50. | You have closed contact with your sibling, friends, and relatives | .538 | .665 |
| 51. | You have good relationship with your neighbors | .675 | .713 |
| 52. | You are satisfy to join in social activities | .724 | .695 |
| 53. | You join in social activities sometimes: the enter priesthood ceremony, wedding ceremony, house warming, funeral ceremony, etc. | .707 | .669 |
| 54. | You hope to work or do activities as well as You do before | .501 | .509 |

Table 13 (continued)

| Item Statement | Factor Loadings | Communalities |
|--|-----------------|---------------|
| Factor8. Basic Physical capacity (5 items) | | |
| 1. You can do some little house work | .687 | .609 |
| 5. You can do routine house work: cooking, laundry, house cleaning, plant watering, etc | .642 | .652 |
| 6. You can do activities of daily living by yourself: eating , bathing, dressing, and personal hygiene | .770 | .709 |
| 16. You can sleep without sleeping pill | .519 | .520 |
| 17. You can have routine excrement | .603 | .580. |
| Factor9. Feeling Empower (3 items) | | |
| 24. You have willpower to caring yourself in this illness condition | .628 | .662 |
| 25. You accept your illness and your status | .694 | .634 |
| 26. You are satisfied with the treatment | .622 | .543 |

From Table 13, There were presented nine factors, 45 items and explained a total of 56.70 % of variances. The identified factors emerged as follow: 1) Symptom & Complication (7 items), 2) Psychological Comfort (6 items), 3) Family Tie (5 items), 4) Adapted Activity of Daily Living (6 items), 5) Economic Stability (4 items), 6) Spiritual Health (4 items), 7) Social Engagement (4 items), 8) Basic Physical capacity (5 items) and 9) Feeling Empower (3 items).

The first factor included 7 items, accounting for 8.24 % of variance with an eigenvalue of 5.11. Factor loading of the first factor ranged from .62 to .80. They

were items in the content of symptom & complication. The seven items were items 7, 8, 9, 10, 11, 12, and 14.

The second factor included 6 items, accounting for 7.87 % of variance with an eigenvalue of 4.88. Factor loading of the second factor ranged from .55 to .81. They were items in the content of Psychological Comfort. The five items were items 27, 28, 29, 30, 31 and 56.

The third factor included 5 items, accounting for 6.55 % of variance with an eigenvalue of 4.06. Factor loading of the third factor ranged from .55 to .83. They were items in the content of Family Tie. The five items were items 46, 47, 48, 49, and 62.

The fourth factor included 6 items, accounting for 6.01 % of variance with an eigenvalue of 3.73. Factor loading of the fourth factor ranged from .57 to .77. They were items in the content of Health Maintenance. The six items were items 15, 19, 20, 21, 22, and 23.

The fifth factor included 4 items, accounting for 5.26 % of variance with an eigenvalue of 3.26. Factor loading of the fifth factor ranged from .60 to .82. They were items in the content of Economic Stability. The four items were items 39, 40, 41, and 42.

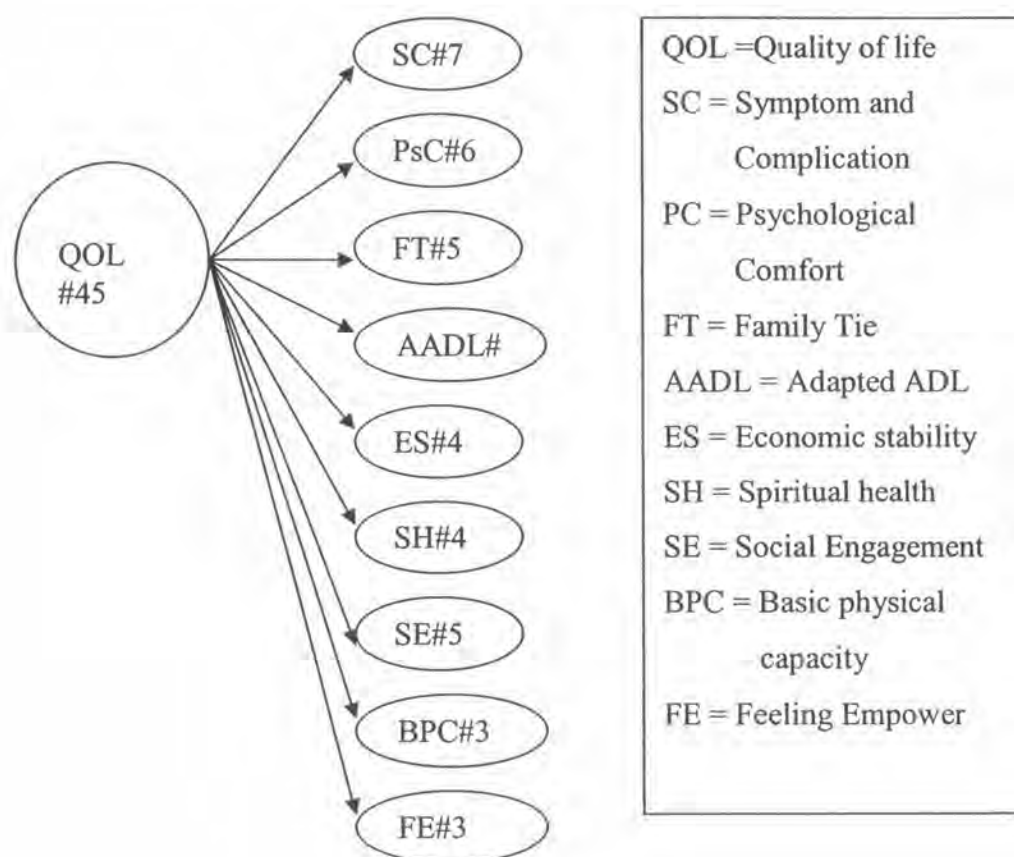
The sixth factor included 4 items, accounting for 5.14 % of variance with an eigenvalue of 3.18. Factor loading of the sixth factor ranged from .65 to .85. They were items in the content of Health Maintenance. The three items were items 58, 59, 60, and 61

The seventh factor included 5 items, accounting for 5.02 % of variance with an eigenvalue of 3.12. Factor loading of the seventh factor ranged from .50 to .74. They were items in the content of Social Relationship. The five items were items 50, 51, 52, 53 and 54.

The eighth factor included 5 items, accounting for 4.88 % of variance with an eigenvalue of 3.30. Factor loading of the forth factor ranged from .65 to .79. They were items in the content of Basic Physical capacity. The three items were items 1, 5, 6, 16, and 17..

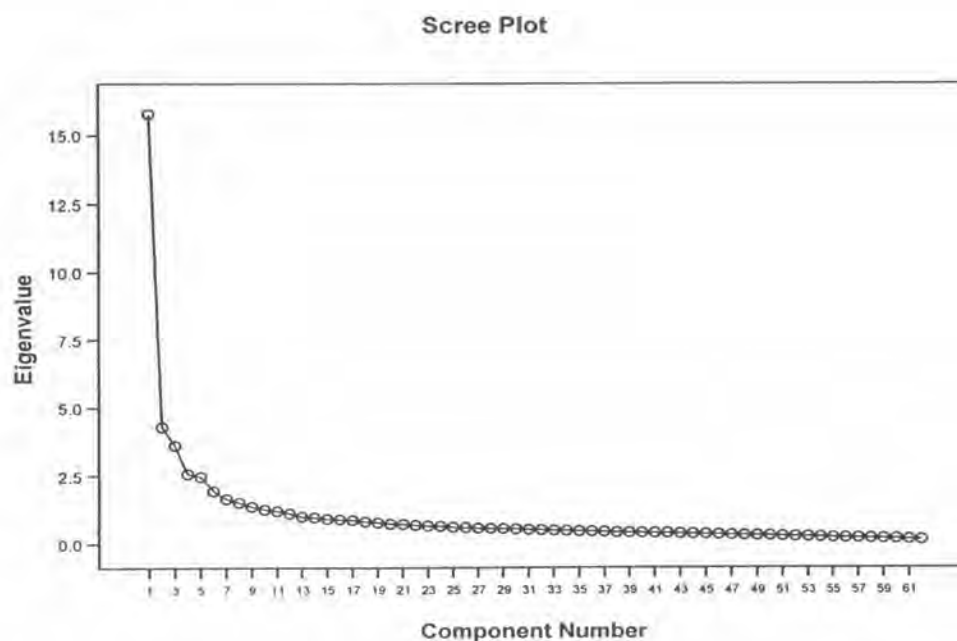
The ninth factor included 3 items, accounting for 3.59 % of variance with and eigenvalue 2.22. Factor loading of the forth factor ranged from .62 to .69. They were items in the content of Feeling Empower. The three items were items 24, 25, and 26.

**Figure 4. Nine factors of a structure of QOL Instrument
in Thai Patients with Post MI**



From Table 14, there presented factor loading of 45 items in nine factors of TQOL instrument. Factor1 named Symptom and Complication, had 7 items, factor loadings ranged between .620 and .809. Factor2 named Psychological Comfort, had 6 items, factor loadings ranged between .545 and .811. Factor3 named Family Tie, had 5 items, factor loadings ranged between .508 and .832. Factor4 named Adapted Health Practice, had 6 items, factor loadings ranged between .570 and .769. Factor5 named Economic Stability, had 4 items, factor loadings ranged between .595 and .820. Factor6 named Spiritual Health, had 4 items, factor loadings ranged between .650 and .827. Factor7 named Social Engagement, had 5 items, factor loadings ranged between .501 and .724. Factor8 named Basic Physical Capacity, had 5 items, factor loadings ranged between .519 and .770. Factor9 named Feeling Empower, had 3 items, factor loadings ranged between .622 and .694.

Figure 5 . Scree Plot



Testing Internal Consistency Reliabilities of the Thai QOL Instrument

The cronbach's alpha coefficient was employed to determine the internal consistency of nine factors of TQOL instrument after extraction presented in (Table14).

Table 15 The Cronbach's alpha coefficient of the nine subscales of TQOL instrument (N = 526)

| QOL Components | NO. of Items | Inter-item Correlation | Item-total Correlation | Alpha Coefficient |
|----------------------------|--------------|------------------------|------------------------|-------------------|
| 1. Symptom & complication | 7 | .39 - .77 | .59 - .77 | .90 |
| 2. Psychological comfort | 6 | .36 - .66 | .51 - .76 | .86 |
| 3. Family relationship | 5 | .37 - .78 | .53 - .82 | .88 |
| 4. Adapted health practice | 6 | .32 - .56 | .50 - .65 | .83 |
| 5. Economic stability | 4 | .49 - .83 | .62 - .79 | .88 |
| 6. Spiritual health | 3 | .40 - .72 | .47 - .74 | .82 |
| 7. Social engagement | 5 | .38 - .64 | .51 - .69 | .83 |
| 8. Basic physical capacity | 5 | .35 - .60 | .52 - .66 | .81 |
| 9. Feeling empower | 3 | .41 - .52 | .49 - .57 | .72 |
| The TQOL instrument | 45 | -.07 - .83 | .10 - .62 | .93 |

From Table15, Internal consistency of the whole TQOL instrument was .93 which was acceptable for a new instrument. A reliability coefficient of .80 is considered the lowest acceptable value for a new developed psychosocial measurement instrument (Burn & Grove, 2001). The internal consistency reliability of each subscale in TQOL instrument was found and the alpha value demonstrated

sufficient correlation: symptom & complication ($r = .90$) psychological comfort ($r = .86$), family relationship ($r = .88$), Adapted health practice ($r = .83$), economic stability ($r = .88$), spiritual health ($r = .82$), social engagement ($r = .83$), basic physical capacity ($r = .81$), and Feeling empower ($r = .72$).

In addition, all 45 items of TQOL instrument had the item-total correlation ranged from .10 to .62, and the inter-item correlation ranged from - .07 to .83.

Table 16 The internal consistency reliability by Cronbach's coefficient alpha of SF36, MacNew Health Related Quality of Life Questionnaire, and Thai Quality of life Instrument (N = 526)

| Item Statement | Alpha Cronbach's coefficient |
|---|------------------------------|
| The SF36 | 0.94 |
| The MacNew Health Related Quality of life Questionnaire | 0.95 |
| The Thai Quality of life Instrument | 0.93 |

Table 16 presented the internal consistency reliability by alpha Cronbarch's coefficient of the three instruments used in this study. The alpha value of SF36 was 0.94. The alpha value of MacNew Health Related Quality of life Questionnaire was 0.95. And the alpha value of Thai Quality of life Instrument was 0.93.

Criterion related validity

The construct validation for criterion-referenced measures is to establish support for the measure's ability to accurately categorize phenomena in accordance

with the purpose for which the measure being used. Criterion-related validity establishes support that a measure functions as it should. Criterion related validity was assessed by calculating the correlation coefficient between the new QOL instrument and the SF-36 which was a generic standard quality of life instrument, and new QOL instrument and the MacNew HRQOL which was a standard specific quality of life instrument used in the Western countries but it was never used in Thailand. Because of no a standard specific quality of life instrument used in Thailand, it was used like a standard in Thailand The result was presented in Table16.

Table 17 The correlation coefficient between TQOL instrument and the SF-36, and TQOL instrument and the MacNew HRQOL Questionnaire

| Measurement | Correlation Coefficient |
|----------------------------------|-------------------------|
| TQOL Instrument and SF-36 | 0.618** |
| TQOL Instrument and MacNew HRQOL | 0.645** |

** Correlation is significant at the 0.01 level (2-tailed).
TQOL = Thai Quality of life Instrument

TQOL instrument had significantly correlation with SF-36 ($r = .62$), and MacNew Health-related Quality of life questionnaires ($r = .65$). It implied that TQOL instrument would have an accuracy of a measure by comparing it with SF-36 or MacNew Health-related Quality of life which were a generic measure and a disease-specific measure.

Norm referenced testing

Norm referenced testing addresses the question “How does the average person score on the test?” It involves the use of standardization that has been developed over several years, with extensive reliability and validity data available (Burn & Grove, 2001: 395). Standardization involves collecting data from thousands of subjects expected to be a broad range of scores on the instrument. In this study, a researcher used t-score by transformation raw scores to be t-score and assigned five score levels with range between minimum and maximum t-scores and divided by five. The norms of QOL in Thai patients with post MI for this study were presented in Table17.

Table18. The norms of QOL in Thai patients with post MI (N = 526)

| QOL Levels | Frequency | T-score | Raw scores |
|------------|-----------|---------|------------|
| Very good | 132 | 71 – 80 | 191 – 222 |
| Good | 48 | 61 – 70 | 184 – 190 |
| Fair | 278 | 41 – 60 | 145 – 183 |
| Poor | 57 | 31 – 40 | 122 – 144 |
| Very poor | 11 | 20 – 30 | 96 – 121 |

Table18 presented the norm scores of QOL in Thai patients with post MI. The first level was very poor t-score (20 -30) or raw score (96-121), the second was poor t-score (31 – 40) or raw score (122-144), the third was fair t-score (41 – 60) or raw score (145-183), the forth was good t-score (61 -70) or raw score (184-190), and the last was very good t-score (71 – 80) or raw score (191-222).