Quality of Life among Patients Undergoing Hemodialysis in Penang, Malaysia

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Background: Quality of life is one of the parameters to check the improvement of hemodialysis treatment among hemodialysed patients. Those patients will be dealing with this treatment in long term if this treatment is the only way for them to replace their kidney function and this thing will affect their quality of life. Objective: To evaluate the quality of life patients on hemodialysis using kidney disease quality of life-short term 24 (KDQoL-SF24) Malaysian Version. Materials and Methods: Cohort observational study was conducted in this study. The study included 78 hemodialysed patients in HD center Penang, Malaysia. Results: There were 9 components which had the lower of the mean and standard deviation (SD) than the standard form; work status (15.01 ± 35.57), cognitive function (75.66 ± 13.75), quality of life social interaction (76.32 ± 16.11), sleep (55.86 ± 15.30), social support (59.61 ± 22.08), patient satisfaction (43.24 ± 15.32), physical functioning (50.06 ± 42.81), general health (29.62 ± 25.56), and role emotional (54.27 ± 49.92). In this HD center, the group of patient’s age who had the lower mean ± SD from the KDQoL-SF Manual Standard were the first and the sixth groups of patient’s age (≤20 and 61–70). Conclusion: The study conducted in HD center, Penang, Malaysia showed that the scoring of work status, cognitive function, quality of social interaction, sleep, social support, patient satisfaction, physical functioning, general health, and role emotional were low than standard form.

Keywords: Kidney disease quality of life-short term 24, Malaysian version, patients on hemodialysis, quality of life

INTRODUCTION

Malaysia is prevalent in end-stage renal disease (ESRD).¹ Hemodialysis is one of the treatments that has been used for ESRD patients,² and this treatment will be used permanently to replace kidney function. Many of hemodialysed patients cannot accept their condition while some of them feel frustrated. Hence, quality of life of these patients will be affected by this continuous treatment. To measure quality of life of hemodialysed patients, kidney disease quality of life-short term 24 (KDQoL-SF24) was used among these patients. This questionnaire was available in RAND Website for Malaysia Version.

In the KDQoL-24, there were 24 questions with 4 categories of questions; health (11 questions), kidney disease (3 questions), effects of kidney disease on daily life (8 questions), and satisfaction with care (2 questions). The website also provides the manual scoring as a guidance to determine the value of the quality of life. The mental and physical health dimensions among hemodialysed patients are strongly associated with morbidity and mortality.³⁻⁵ Nutritional status, HD duration, age, and ethnicity are other factors which are associated with quality of life of hemodialysed patients.⁶⁻⁷

Information about quality of life among hemodialysed patients in Malaysia is limited. A limited number

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of studies have examined the relationship between sociodemographics with quality of life among hemodialysed patients. Due to that, the relationship between the socio-demographics and quality of life of hemodialysed patients in HD center Penang, Malaysia is necessary to be conducted.

MATERIALS AND METHODS

Study location
Research was carried out in hemodialysis ward General Hospital Pulau Pinang, Malaysia.

Study participants
The study included diabetic and hypertensive patients who had undergone hemodialysis. Universal sampling was used to select 78 hemodialysed patients in HD center Penang, Malaysia.

Study design
A cohort prospective study was conducted in this HD center.

Inclusion criteria
1. All hemodialysis patients who have diabetic and hypertensive
2. Patients ≥18 years.

Exclusion criteria
1. Patients <18 years
2. Cancer patients
3. Pregnancy patients
4. HIV/AIDS patients
5. Systemic lupus erythema patients.

Ethical clearance
Ethical clearance was sourced by Clinical Research Committee General Hospital Pulau Pinang. The approval letter was given before starting of data collection with the number: (5)KKM/NIHSEC/P16-133.

Data collection and handling
The researcher would define the patients by the list of patients in the ward, and before collecting data from medical record, the researcher would explain about the research (background and the purpose of the research) to the patients. Data collection would be starting after patients signed the informed consent as an agreement of the research. For assessing quality of life among hemodialysed patients in HD center Penang, Malaysia, KDQoL-SF24 Malaysian version was downloaded from RAND website and was used. KDQoL-SF24 for Malaysian version can be downloaded in RAND website.

Results
To assess health-related quality of life (HRQOL) hemodialysed patients in both HD centers, KDQoL-SF24 was used. Figure 1 shows the total number of patients who were included in the assessment of HRQOL using KDQoL-24 in HD center in Penang, Malaysia. The total number of patients was 78 patients; 48 patients were males and 30 patients were females.

Figure 2 shows 7 groups of patient’s age (≤20, 21–30, 31–40, 41–50, 51–60, 61–70, and >70) who were included in the assessment of KDQoL-SF24 in this HD center. The highest number of patient was the fifth group; 29 patients.

Scoring of kidney disease quality of life-short term 24
Table 1 shows mean and standard deviation (SD) of each component in KDQoL-SF24 questionnaire between the study and the standard form in HD center Penang, Malaysia.

The mean score and SD for overall health rating in this HD center were higher than standard form as shown in Table 1.

Table 2 shows correlation between gender and KDQoL-SF24 scores for each component among hemodialysed patients in Penang, Malaysia.

There was no significant relationship between each component of KDQOL-SF24 and gender among hemodialysed patients in this HD center as shown in Table 2, but there was significant correlation between gender and question 17 (part of sleep component).

Table 3 shows correlation between age and KDQoL-24 score for each component among hemodialysed patients in Penang, Malaysia.

No significant relationship between age and each of KDQOL-24 component was found in this HD center.

Table 4 shows correlation between race and KDQoL-24 score for each component among hemodialysed patients in a HD center Penang, Malaysia.
There are three races in Malaysia: Malay, Chinese, and Indian. The race in Indonesia is only one; Indonesian. Correlation between race and score of each item on KDQoL-SF24 was conducted only for HD center Penang, Malaysia.

In this HD center, no significant relationship was found between race and each component of KDQoL-SF2 as shown in Table 4, but there was significant correlation between race and question 12c (part of burden of kidney disease component), question 13a (part of quality of social interaction), and question 9g (part of energy/fatigue component).

Table 5 shows correlation between clinical outcome and overall health rating of KDQoL-SF24 score among hemodialysed patients in Penang, Malaysia.

There was no significant relationship found between clinical outcome and overall health rating of KDQoL-SF24 among hemodialysed patients in Penang, Malaysia as shown in Table 5.

Table 6 shows mean and SD of each component in KDQoL-SF24 questionnaire between the study and standard form among hemodialysed patients in Penang, Malaysia based on gender.

The mean ± SD between male and female in this HD center was more than the manual standard as shown in Table 6. It means the quality of life of those hemodialysed patients based on gender was good.

Table 7 shows mean and SD of each component in KDQoL-SF24 questionnaire between the study and standard form among hemodialysed patients in Penang, Malaysia based on age.

There were 7 groups of patient’s age (≤20, 21–30, 31–40, 41–50, 51–60, 61–70, and >70). In this HD center, the group of patient’s age who had the lower mean ± SD from the KDQoL-SF Manual Standard were

Table 1: Scoring of kidney disease quality of life-short form 24 questionnaire for 78 Malaysian patients

| Component                      | Number of component | Score of each component | Mean±SD          | Standard form          |
|--------------------------------|---------------------|-------------------------|------------------|------------------------|
| Symptom/problem                | 12                  | 78.55±7.33              | 71.21±16.77      |
| Effects of kidney disease      | 8                   | 67.71±29.69             | 57.30±24.53      |
| Burden of kidney disease       | 4                   | 60.43±25.94             | 49.62±30.27      |
| Work status                    | 2                   | 15.01±35.57*            | 25.26±37.82      |
| Cognitive function             | 3                   | 75.66±13.75*            | 79.11±19.75      |
| Quality of social interaction  | 3                   | 76.32±16.11*            | 76.65±18.71      |
| Sexual function                | 2                   | 83.17±20.31             | 69.30±36.17      |
| Sleep                          | 4                   | 55.86±15.30*            | 60.68±28.61      |
| Social support                 | 2                   | 59.61±22.08*            | 64.61±27.73      |
| Dialysis staff encouragement   | 2                   | 73.72±14.97             | 69.90±23.13      |
| Patient satisfaction           | 1                   | 43.24±15.32*            | 71.38±22.04      |
| Physical functioning           | 10                  | 50.06±42.81*            | 51.83±29.73      |
| Role - physical                | 4                   | 40.71±49.21             | 32.46±39.68      |
| Pain                           | 2                   | 65.83±29.56             | 60.40±30.11      |
| RAND scoring                   |                      | 57.60±29.7              |
| SF-36™ scoring                 | 2                   | 65.83±29.56             | 60.40±30.11      |
| General health                 |                      | 57.60±29.7              |
| RAND scoring                   | 5                   | 29.62±25.56*            | 42.88±24.32      |
| SF-36™ scoring                 |                      | 42.88±24.32             |
| Emotional well-being           | 5                   | 77.80±22.72             | 69.54±20.36      |
| Role - emotional               | 3                   | 54.27±49.92*            | 57.76±43.90      |
| Social function                | 2                   | 66.83±23.62             | 63.57±29.77      |
| Energy/fatigue                 | 4                   | 66.60±28.26             | 45.89±24.06      |
| Overall health rating          | 80                  | 61.57±33.79             | 59.37±19.54      |

*Low. SD: Standard deviation, SF: Short form
Table 2: Kidney disease quality of life-short form 24 scores for each component based on gender among hemodialysis patients in HD Centre Penang, Malaysia

| Score component | Malaysia Median (scores) | P* |
|-----------------|-------------------------|----|
| Symptom/problem | Males (n=48) Females (n=30) |    |
| Question 14a    | 75 75 | 0.53 |
| Question 14b    | 100 100 | 0.66 |
| Question 14c    | 100 100 | 0.08 |
| Question 14d    | 75 75 | 0.13 |
| Question 14e    | 100 100 | 0.14 |
| Question 14f    | 100 100 | 0.93 |
| Question 14g    | 75 75 | 0.71 |
| Question 14h    | 87.5 75 | 0.45 |
| Question 14i    | 75 75 | 0.58 |
| Question 14j    | 75 75 | 0.83 |
| Question 14k    | 75 75 | 0.82 |
| Question 14l    | 100 100 | 0.41 |
| Effects of kidney disease | 600 562.5 | 0.67 |
| Question 15a    | 75 75 | 0.20 |
| Question 15b    | 100 62.5 | 0.18 |
| Question 15c    | 50 50 | 0.93 |
| Question 15d    | 50 50 | 0.94 |
| Question 15e    | 75 50 | 0.43 |
| Question 15f    | 100 87.5 | 0.98 |
| Question 15g    | 75 75 | 0.79 |
| Question 15h    | 100 100 | 0.79 |
| Burden of kidney disease | 262.5 250 | 0.77 |
| Question 12a    | 75 75 | 0.50 |
| Question 12b    | 75 50 | 0.25 |
| Question 12c    | 75 75 | 0.22 |
| Question 12d    | 75 75 | 0.48 |
| Work status     | 0 0 | 0.37 |
| Question 20     | 0 0 | 0.29 |
| Question 21     | 0 0 | 0.40 |
| Cognitive function | 240 240 | 0.79 |
| Question 13a    | 80 80 | 0.99 |
| Question 13b    | 80 80 | 0.32 |
| Question 13c    | 80 80 | 0.45 |
| Quality of social interaction | 240 240 | 0.54 |
| Question 13a    | 80 80 | 0.75 |
| Question 13b    | 80 80 | 0.09 |
| Question 13c    | 80 80 | 0.40 |
| Sexual function | 200 200 | 0.42 |
| Question 16a    | 100 100 | 0.42 |
| Question 16b    | 100 100 | 0.41 |
| Sleep           | 220 220 | 0.32 |
| Question 17     | 55 60 | 0.03* |
| Question 18a    | 60 60 | 0.76 |
| Question 18b    | 40 40 | 0.75 |
| Question 18c    | 60 60 | 0.94 |
| Social support  | 133.33 133.33 | 0.30 |
| Question 19a    | 66.66 66.66 | 0.47 |

Table 2: Contd...

| Score component | Malaysia Median (scores) | P* |
|-----------------|-------------------------|----|
| Question 19b    | 66.66 66.66 | 0.17 |
| Dialysis staff encouragement | 150 150 | 0.25 |
| Question 24a    | 75 75 | 0.09 |
| Question 24b    | 75 75 | 0.65 |
| Patient satisfaction | 133.33 133.33 | 0.51 |
| Question 23    | 33.33 33.33 | 0.63 |
| Physical functioning | 600 625 | 0.71 |
| Question 3a    | 25 0 | 0.47 |
| Question 3b    | 50 50 | 0.65 |
| Question 3c    | 50 50 | 0.87 |
| Question 3d    | 50 50 | 0.97 |
| Question 3e    | 100 100 | 0.74 |
| Question 3f    | 75 100 | 0.75 |
| Question 3g    | 50 50 | 0.72 |
| Question 3h    | 50 50 | 0.72 |
| Question 3i    | 50 50 | 0.32 |
| Question 3j    | 100 100 | 0.13 |
| Role - physical | 200 0 | 0.42 |
| Question 4a    | 100 0 | 0.64 |
| Question 4b    | 100 0 | 0.64 |
| Question 4c    | 0 0 | 0.28 |
| Question 4d    | 0 0 | 0.39 |
| Pain            | 110 110 | 0.62 |
| Question 7     | 60 60 | 0.78 |
| Question 8     | 50 50 | 0.61 |
| General health | 100 125 | 0.63 |
| Question 1    | 50 50 | 0.58 |
| Question 11a   | 50 50 | 0.79 |
| Question 11b   | 25 25 | 0.88 |
| Question 11c   | 25 12.5 | 0.38 |
| Question 11d   | 0 0 | 0.69 |
| Emotional well-being | 280 360 | 0.09 |
| Question 9b    | 60 80 | 0.36 |
| Question 9c    | 60 80 | 0.15 |
| Question 9d    | 40 40 | 0.85 |
| Question 9f    | 60 80 | 0.09 |
| Question 9h    | 40 40 | 0.46 |
| Role - emotional | 200 300 | 0.49 |
| Question 5a    | 0 100 | 0.30 |
| Question 5b    | 100 100 | 0.49 |
| Question 5c    | 100 100 | 0.83 |
| Social function | 112.5 100 | 0.84 |
| Question 6    | 75 50 | 0.96 |
| Question 10    | 75 62.5 | 0.86 |
| Energy/fatigue | 240 250 | 0.58 |
| Question 9a    | 40 40 | 0.73 |
| Question 9e    | 40 40 | 0.58 |
| Question 9g    | 100 100 | 0.25 |
| Question 9i    | 60 60 | 0.89 |

*A Mann-Whitney U-test

the first and the sixth groups of patient’s age (≤20 and 61–70) as shown in Table 7. The lower scores showed
Table 3: Kidney disease quality of life-short form 24 score for each component based on age among hemodialysed patients in Penang, Malaysia

| Score component                   | Malaysia            |       |       |       |       |
|-----------------------------------|---------------------|-------|-------|-------|-------|
|                                   | Median (scores)     | ≤40 (n=7) | 41-50 (n=11) | 51-60 (n=29) | 61-70 (n=17) | >70 (n=14) | P*   |
| Symptom/problem                   |                     |       |       |       |       |       |       |
| Question 14a                      | 1075                | 1050   | 1000  | 975   | 1050  |         | 0.94  |
| Question 14b                      | 100                 | 75     | 75    | 75    | 75    |         | 0.95  |
| Question 14c                      | 100                 | 100    | 100   | 100   | 100   |         | 0.71  |
| Question 14d                      | 100                 | 75     | 75    | 100   | 75    |         | 0.62  |
| Question 14e                      | 100                 | 75     | 100   | 100   | 75    |         | 0.83  |
| Question 14f                      | 75                  | 100    | 100   | 100   | 75    |         | 0.69  |
| Question 14g                      | 75                  | 75     | 75    | 75    | 75    |         | 0.45  |
| Question 14h                      | 75                  | 75     | 75    | 75    | 100   |         | 0.76  |
| Question 14i                      | 75                  | 75     | 75    | 75    | 75    |         | 0.89  |
| Question 14j                      | 75                  | 75     | 75    | 75    | 75    |         | 0.76  |
| Question 14k                      | 75                  | 100    | 75    | 75    | 75    |         | 0.38  |
| Question 14l                      | 100                 | 100    | 100   | 100   | 100   |         | 0.81  |
| Effects of kidney disease         |                     |       |       |       |       |       |       |
| Question 15a                      | 650                 | 625    | 600   | 475   | 612.5 |         | 0.85  |
| Question 15b                      | 75                  | 75     | 75    | 75    | 75    |         | 0.39  |
| Question 15c                      | 75                  | 75     | 100   | 75    | 75    |         | 0.70  |
| Question 15d                      | 50                  | 50     | 50    | 50    | 50    |         | 0.84  |
| Question 15e                      | 50                  | 50     | 50    | 50    | 50    |         | 0.77  |
| Question 15f                      | 75                  | 50     | 75    | 50    | 62.5  |         | 0.93  |
| Question 15g                      | 100                 | 100    | 100   | 75    | 100   |         | 0.82  |
| Question 15h                      | 100                 | 100    | 100   | 75    | 75    |         | 0.85  |
| Burden of kidney disease          |                     |       |       |       |       |       |       |
| Question 12a                      | 300                 | 225    | 200   | 300   | 250   |         | 0.54  |
| Question 12b                      | 50                  | 75     | 75    | 50    | 75    |         | 0.24  |
| Question 12c                      | 75                  | 75     | 50    | 75    | 75    |         | 0.76  |
| Question 12d                      | 75                  | 75     | 75    | 75    | 75    |         | 0.85  |
| Work status                       | 0                   | 0      | 0     | 0     | 0     |         | 0.96  |
| Question 20                       | 0                   | 0      | 0     | 0     | 0     |         | 0.88  |
| Question 21                       | 0                   | 0      | 0     | 0     | 0     |         | 0.93  |
| Cognitive function                |                     |       |       |       |       |       |       |
| Question 13a                      | 240                 | 240    | 240   | 240   | 240   |         | 0.93  |
| Question 13b                      | 80                  | 80     | 80    | 80    | 80    |         | 0.35  |
| Question 13d                      | 80                  | 80     | 80    | 80    | 80    |         | 0.87  |
| Question 13f                      | 80                  | 80     | 80    | 80    | 80    |         | 0.68  |
| Quality of social interaction     |                     |       |       |       |       |       |       |
| Question 13a                      | 240                 | 260    | 240   | 240   | 240   |         | 0.89  |
| Question 13c                      | 80                  | 100    | 80    | 80    | 80    |         | 0.72  |
| Question 13e                      | 80                  | 80     | 80    | 80    | 80    |         | 0.73  |
| Question 13e                      | 80                  | 80     | 80    | 80    | 80    |         | 0.66  |
| Sexual function                   |                     |       |       |       |       |       |       |
| Question 16a                      | 200                 | 200    | 200   | 150   | 175   |         | 0.96  |
| Question 16b                      | 100                 | 100    | 100   | 75    | 87.5  |         | 0.97  |
| Question 16b                      | 100                 | 100    | 100   | 75    | 87.5  |         | 0.96  |
| Sleep                             | 210                 | 220    | 220   | 220   | 220   |         | 0.24  |
| Question 17                       | 50                  | 60     | 60    | 50    | 60    |         | 0.25  |
| Question 18a                      | 60                  | 60     | 60    | 60    | 60    |         | 0.64  |
| Question 18b                      | 40                  | 40     | 40    | 40    | 40    |         | 0.24  |
| Question 18c                      | 60                  | 60     | 60    | 60    | 60    |         | 0.71  |
| Social support                    | 133.33              | 99.99  | 133.32 | 99.99  | 133.32 |         | 0.17  |
| Question 19a                      | 33.33               | 33.33  | 66.66  | 66.66  | 66.66  |         | 0.21  |
| Question 19b                      | 66.66               | 66.66  | 66.66  | 66.66  | 66.66  |         | 0.07  |
| Dialysis staff encouragement      | 150                 | 150    | 150   | 150   | 150   |         | 0.20  |

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that the quality of life of those component among diabetic and/or hypertensive patients who had undergone hemodialysis was not good.

| Score component | Malaysia | $P^*$ |
|-----------------|----------|-------|
| Question 24a    | 75       |       |
| Question 24b    | 75       |       |
| Patient satisfaction | 50 | 33.33 | 33.33 | 33.33 | 50 | 0.13 |
| Question 23     | 50       |       |
| Physical functioning | 750 | 750 | 600 | 600 | 750 | 0.68 |
| Question 3a     | 50       |       |
| Question 3b     | 50       | 100   |
| Question 3c     | 50       | 50    |
| Question 3d     | 50       | 50    |
| Question 3e     | 100      | 100   |
| Question 3f     | 50       |       |
| Question 3g     | 50       |       |
| Question 3h     | 50       |       |
| Question 3i     | 50       |       |
| Question 3j     | 100      | 100   |
| Role - physical | 0        | 300   |
| General health  | 125      | 175   |
| Question 1      | 25       | 50    |
| Question 11a    | 25       | 75    |
| Question 11b    | 25       | 25    |
| Question 11c    | 25       | 25    |
| Role - emotional| 0        | 300   |
| Social function | 100      | 150   |
| Question 6      | 75       | 75    |
| Question 10     | 50       | 75    |
| Energy/fatigue  | 240      | 260   |
| Question 9a     | 40       | 60    |
| Question 9e     | 40       | 60    |
| Question 9g     | 100      | 100   |
| Question 9i     | 60       | 60    |

*A Kruskal-Wallis test

**Discussion**

In HD center Penang, Malaysia, the mean (SD) of work status, cognitive function, quality of social interaction,
### Table 4: Kidney disease quality of life—short form 24 scores for each component based on race among hemodialysed patients in a HD Center Penang, Malaysia

| Score component | Median (scores) | Malaysia (n=35) | Indian (n=30) | Chinese (n=38) | P* |
|-----------------|----------------|----------------|---------------|----------------|----|
| **Symptom/problem** |                |                |               |                |    |
| Question 14a    | 75             | 75             | 75            | 0.97           |    |
| Question 14b    | 100            | 100            | 100           | 0.83           |    |
| Question 14c    | 100            | 75             | 100           | 0.89           |    |
| Question 14d    | 75             | 50             | 87.5          | 0.32           |    |
| Question 14e    | 100            | 75             | 100           | 0.58           |    |
| Question 14f    | 100            | 100            | 75            | 0.96           |    |
| Question 14g    | 75             | 100            | 75            | 0.53           |    |
| Question 14h    | 75             | 75             | 87.5          | 0.91           |    |
| Question 14i    | 75             | 75             | 75            | 0.32           |    |
| Question 14j    | 75             | 75             | 75            | 0.73           |    |
| Question 14k    | 75             | 75             | 75            | 0.79           |    |
| Question 14l    | 100            | 100            | 100           | 0.59           |    |
| **Effects of kidney disease** |                |                |               |                |    |
| Question 15a    | 75             | 50             | 75            | 0.10           |    |
| Question 15b    | 75             | 75             | 100           | 0.89           |    |
| Question 15c    | 50             | 25             | 50            | 0.29           |    |
| Question 15d    | 50             | 50             | 50            | 0.78           |    |
| Question 15e    | 50             | 50             | 75            | 0.86           |    |
| Question 15f    | 75             | 75             | 100           | 0.33           |    |
| Question 15g    | 100            | 50             | 75            | 0.26           |    |
| Question 15h    | 100            | 75             | 100           | 0.22           |    |
| **Burden of kidney disease** |                |                |               |                |    |
| Question 12a    | 50             | 50             | 75            | 0.19           |    |
| Question 12b    | 75             | 25             | 62.5          | 1.00           |    |
| Question 12c    | 75             | 50             | 75            | 0.04*          |    |
| Question 12d    | 75             | 50             | 75            | 0.16           |    |
| **Work status** |                |                |               |                |    |
| Work status     | 0              | 0              | 0             | 0.50           |    |
| Question 20     | 0              | 0              | 0             | 0.50           |    |
| Question 21     | 0              | 0              | 0             | 0.16           |    |
| **Cognitive function** |               |                |               |                |    |
| Question 13b    | 80             | 60             | 80            | 0.45           |    |
| Question 13d    | 80             | 60             | 80            | 0.44           |    |
| Question 13f    | 60             | 80             | 80            | 0.96           |    |
| **Quality of social interaction** |            |                |               |                |    |
| Question 13a    | 80             | 60             | 80            | 0.03*          |    |
| Question 13c    | 80             | 60             | 80            | 0.07           |    |
| Question 13e    | 80             | 60             | 80            | 0.57           |    |
| **Sexual function** |               |                |               |                |    |
| Question 16a    | 100            | 75             | 87.5          | 0.82           |    |
| Question 16b    | 100            | 75             | 87.5          | 0.78           |    |
| **Sleep** |                |                |               |                |    |
| Question 17     | 60             | 60             | 60            | 0.54           |    |
| Question 18a    | 60             | 60             | 60            | 0.19           |    |
| Question 18b    | 40             | 40             | 40            | 0.86           |    |
| Question 18c    | 60             | 60             | 60            | 0.58           |    |
| **Social support** |                |                |               |                |    |
| Question 19a    | 66.66          | 66.66          | 66.66         | 0.32           |    |
| Question 19b    | 66.66          | 66.66          | 66.66         | 0.84           |    |
| **Dialysis staff encouragement** |            |                |               |                |    |
| Question 20      | 150           | 150           | 150           | 0.28           |    |

*Contd...*
sleep, social support, patient satisfaction, physical functioning, general health and role emotional were lower than the KDQoL-SF Manual Standard. It means the quality of life of those hemodialysed patients for those component was not good. In this HD center, overall, hemodialysis gave impact to social activity of
those patients although physical functioning and sleep activity were also influenced by hemodialysis treatment. This finding is also similar with M. Nakayama et al.’s study while 22% of 179 patients became unemployed after dialysis inception with a corresponding decrease in average working hours and annual income.[9] Sleep disorder, role emotional, and physical functioning are the components, which also can determine the quality of life of diabetic and/or hypertensive patients who had undergone hemodialysis. Zyoud et al.’s study revealed significant positive association between HRQOL and male gender among patients on hemodialysis.[10] Another study which was conducted in Malaysia discovered that quality of life of patients on dialysis was positively influenced by gender, body mass index, religion, education, marital status, occupation, income, mode of dialysis, hemoglobin, diabetes mellitus, coronary heart disease, cerebral vascular accident, and leg amputation.[11]

In HD center Penang, Malaysia, race is one of the parts of sociodemography which always be assessed. Overall, race did not influence KDQOL-SF24 components, but there was some significant relationship between race and one question of burden of kidney disease component, one question of social interaction component, and one question of energy/fatigue component in a HD center Penang, Malaysia. The same finding is found in Feroze et al.’s study while they revealed no significant differences between racial and quality of life in the other four health-related quality of life among 223 hemodialysis patients – African Americans.[12] Another study found race as a risk factor in mortality among hemodialysed patients while African patients undergoing dialysis had a lower death rate compared with American patients (232,361 deaths [57.1% mortality] vs. 585,792 deaths [63.5% mortality]).[13]

**Conclusion**

Assessment of KDQoL-SF24 among hemodialysed patients in HD center Penang, Malaysia showed that the scoring of work status, cognitive function, quality of social interaction, sleep, social support, patient satisfaction, physical functioning, general health, and role emotional were low than the standard form. From the overall health rating – KDQoL-SF24, the group of patient’s age who had the lower mean ± SD from the standard form were the first and the sixth groups of patient’s age (≤20 and 61–70).

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**Conflicts of interest**

There are no conflicts of interest.

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