Health Related-Quality of Life in CKD and Dialysis Patients in Asian Countries: A Systematic Review

Kualitas Hidup Terkait Kesehatan pada Pasien Gagal Ginjal dan Dialisis di Negara Asia: Tinjauan Sistematis

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ABSTRACT

Chronic Kidney Disease (CKD) and Chronic dialysis has a great impact on patient's health-related quality of life (HRQOL). The impacts are about the morbidity, mortality, and the survival rate of the dialysis therapy. We focused this systematic review in Asian countries. Systematic Review with PRISMA method retrieved from online database such as PubMed, Wiley and ProQuest using a keyword "Health Related-Quality Life (HRQOL)", "Chronic Kidney Disease (CKD) patient OR ESRD (End Stage Renal Disease), CKD with Hemodialysis OR CKD dialysis at Asian Country". The end of this search we got 10 journals. The measurement HRQOL in CKD or dialysis patients such EQ-5D and Kidney Disease Quality of Life (KDQOL). There are 4 country used KDQL (Korea, China, India, Singapore and Indonesia). The result show HRQOL in CKD patients has declined when the level of CKD increased especially when the amount of albumin high and the level of hemoglobin decline. HRQOL in dialysis patient has lower depressive mood in planned dialysis group than unplanned dialysis. There is no difference in KDCS, PCS, or MCS scores between patients treated by hemodialysis and CAPD. They also got 5 more years when choose dialysis (Hemodialysis). Health related quality of life (HRQOL) related with progressive of CKD level. The level that should pay attention is CKD level 3 where HRQOL can decreased. When the patient's routine dialysis (CAPD or hemodialysis) used concern about the medicine (such erythropoietin, routine medicine) and the laboratory (albumin and hemoglobin). The more progressive level of CKD the lower of HRQOL.

Keywords: Health Related Quality of Life (HQOL), CKD (Chronic Kidney Disease), Dialysis, Hemodialysis, Continuous Ambulatory Peritoneal Dialysis (CAPD)

ABSTRAK

Penyakit Ginjal Kronis (PGK) dan dialisis kronis memiliki dampak besar pada kualitas hidup terkait kesehatan pasien. Dampaknya adalah tentang morbiditas, mortalitas, dan tingkat kelangsungan hidup dari terapi dialisis. Kami memfokuskan tinjauan sistematis ini di negara-negara Asia. Tinjauan Sistematik dengan metode PRISMA yang diambil dari basis data online seperti PubMed, Wiley, dan ProQuest menggunakan kata kunci "Kualitas Hidup terkait Kesehatant (HRQOL)", "pasien Penyakit Ginjal Kronis (PGK) atau Penyakit Ginjal Stadium Akhir; Penyakit Ginjal Kronis dengan hemodialisis atau dialisis PGK di Negara Asia ". Akhir pencarian ini kami mendapat 10 jurnal. Pengukuran Kualitas Hidup Terkait Kesehatan pada pasien PGK atau dialisis menggunakan EQ-5D dan KDQL. Ada 4 negara yang menggunakan KDQL (Korea, Cina, India, Singapura dan Indonesia). Hasilnya menunjukkan kualitas hidup pada pasien PGK telah menurun ketika tingkat PGK meningkat terutama jika jumlah albumin tinggi dan tingkat hemoglobin menurun. Kualitas hidup pada pasien dialisis memiliki suasana hati depresi yang lebih rendah pada kelompok dialisis yang direncanakan daripada dialisis yang tidak direncanakan. Tidak ada perbedaan dalam skor KDCS, PCS, atau MCS antara pasien yang diobati dengan hemodialisis dan CAPD. Mereka juga mendapat 5 tahun lebih ketika memilih dialisis (Hemodialisis). Kualitas hidup terkait kesehatan berhubungan dengan progresifitas tingkat PGK. Level yang harus diperhatikan adalah PGK level 3 di mana kualitas hidup dapat menurun. Ketika pasien dialisis rutin (CAPD atau hemodialisis) mereka harus menggunakan obat (seperti erythropoietin dan obat rutin) dan cek laboratorium (albumin dan hemoglobin). Semakin progresif level PGK maka semakin rendah kualitas hidupnya.

Kata kunci: Kualitas Hidup Terkait Kesehatan, PGK (Penyakit Ginjal Kronis), Dialisis, Hemodialisis, Continuous Ambulatory Peritoneal Dialysis (CAPD)

INTRODUCTION

Centers for Disease and Control Preventions (CDC) (2017) recording that, in 2014, 118,000 people in the United States started the treatment for ESRD (End Stage Renal Disease), and 662,000 were living in a chronic dialysis or with a kidney transplant. How was it in Asian countries? In 2012, there were more than > 300,000 ESRD patients in Japan (Reiko Okubo, et al., 2013). The numbers were even higher in China. During the same year, it was estimated that there were about 199,5 million, CKD patients suffering from the disease (Zhangzhe Peng, et al., 2017). Moreover, Indonesian Renal Registry (IRR) recorded that in 2015, there were about 30,554 active patients who routinely took hemodialysis. Chronic Kidney Disease (CKD) and Chronic dialysis has a great impact on patient's health-related quality of life (HRQOL) (Yang, F., 2015).

HRQOL is empirically estimated to affect QoL. This the term to signify only the utilities associated with the health state (Karimi, M., 2016). According to Walters (2009), Quality of life (QoL) is a complex concept with multiple aspects that include: cognitive functioning; emotional functioning; psychological well-being; general health; physical functioning; physical symptoms and toxicity; role functioning; sexual functioning; social well-being and functioning; and spiritual/existential issues. Health-related quality of life (HRQOL) is very important for ESRD and dialysis patients. Because its reportedly affects the morbidity and mortality of patients with end-stage renal disease (ESRD) (Park JI, et al. 2015). From this systematic review we want to know how to reach the HRQOL CKD patients and dialysis patients in Asian Country.

SUBJECTS AND METHODS

This research was conducting by doing a systematic review with PRISMA method. Data were retrieved from online database such as PubMed, Wiley and ProQuest using "Health Related-Quality Life (HRQOL)", "Chronic Kidney Disease (CKD) patient OR ESRD (End Stage Renal Disease), CKD with Hemodialysis OR CKD dialysis" at Asian Countries as keywords. From those keywords the search engine found 95 international journals dan 2 journals from local. We limited the journal paper numbers by duplication and years (2010 -2018) which resulted 22 journal papers. Based on the titles, we picked 16 journal papers. However, after further reading including the abstract sections, we got 10 journal papers. We also used P.I.C.O Model; the population is all CKD patients in Asian countries, the intervention is to measure the health-related quality of life patients, the comparison is all dialysis patients in Asian countries, and the objectives is to know the health-related quality of life CKD and dialysis patients.

Articles included and assessed for the eligibility of in this review were those that showed Health Quality of Life (HRQOL) in CKD and dialysis patient at Asian countries (Korea, Japan, Singapore, China and Indonesia). The inclusion criteria were adult patients (19-65+ years old), patient who had CKD or CKD with dialysis and lived in Asian countries. In addition, the article was published between 2010 and 2018. Articles excluded from this review were those that did not match the criteria; namely the patients discussed were younger than 19 years old, were not in Asian countries and the article were published before 2010.

RESULTS

In a prospective cohort study in Korea (Park JI, et al. 2015), a total of 643 patients were analyzed. It was found that referral type affected neither Kidney Disease Quality of Life Short Form 36 (KDQOL-36) nor Beck's Depression Inventory (BDI) scores. However, the planned dialysis group showed significantly better scores in 4 of 5 KDQOL-36 domains than did the unplanned group within 3 months after dialysis. In additions, the effects were partly sustained for 1 year after dialysis. The benefits of planned dialysis were significant after adjustment of age, sex, type of dialysis, marital status, educational attainment, occupation, modified Charlson comorbidity index, albumin, and hemoglobin levels. Beck's Depression Inventory (BDI) scores were also lower, which indicated that there was less depressive mood in planned dialysis group than that in unplanned group in both 3 months and 1 year after dialysis. Another journal research in Korea (Park JI, et al., 2016), reported that the total crude CKD prevalence estimation for 20 years adults or older in Korea was 5.5%.
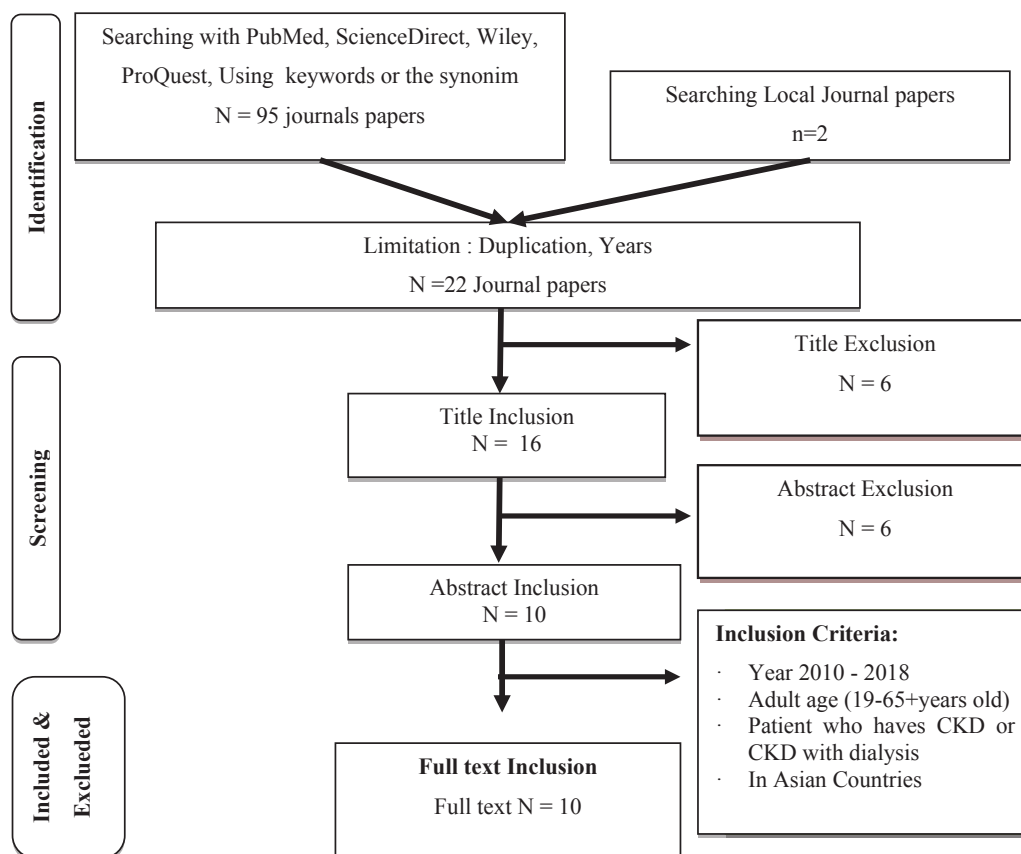
Figure 1. Systematic Review flow Diagram

After the adjustments for age, sex, risk factors, and comorbid conditions, the EQ-5D index was lower in that without CKD, with the mean differences of 20.004 (95% CI, 20.015 to 0.007), 20.016 (95% CI, 20.032 to 20.000), 20.020 (95% CI, 20.029 to 20.011), 20.052 (95% CI, 20.072 to 20.032), and 20.067 (95% CI, 20.101 to 20.032), for CKD eGFR categories of 90, 60 to 89, 45 to 59, 30 to 44, and 30 mL/min/1.73 m2. In the subgroup of older adults (60 years old or more), the adjusted mean difference in the EQ-5D index was lower in the CKD eGFR category of 60 to 89 mL/min/1.73 m2, but not in the eGFR category of 45 to 59 mL/min/1.73 m2, compared to non-CKD.

Over a 3-year follow-up study in Japan (Okubo, R. et al., 2013), the quality-adjustment weight using EuroQol (EQ-5D) was conducted. The quality-adjustment weight at stage (G) 4-5 was significantly lower than that at stage (G) 1-2. Moreover, and the weights at proteinuria stage (A) 3 were significantly lower than those at A1-2. The quality-adjustment weights of patients with

events such as 50% of the estimated glomerular filtration rate (GFR) declined. Dialysis, CVD, and/or death were significantly lower than those without events. Using EQ-5D (Tajima, R. et al., 2010), the measured quality-adjustment weights by the CKD stage were 0.940 (95% CI 0.915–0.965), 0.918 (0.896–0.940), 0.883 (0.857–0.909), 0.839 (0.794–0.884), and 0.798 (0.757–0.839) for stages 1–5, respectively. The decrease in weight was significant by ANOVA (P\0.0001), and the weight for all stages was 0.885 (0.871–0.898). There was a positive relationship between hemoglobin/ serum albumin and the weight. The presence of hypertension lowered the weight from 0.910 (0.885–0.936) to 0.874 (0.858–0.891), diabetes from 0.901 (0.886–0.917) to 0.840 (0.811–0.869), and CVD from 0.892 (0.878–0.906) to 0.783 (0.718–0.848).

In a study held in China, CKD stage 3 was split into two models (CKD 3a and CKD 3b). Compared with CKD G3a group, the proportions of subjects with hyperuricemia and anemia were significantly higher in CKD G3b

group (61.4% vs. 52.0% and 26.4% vs. 17.9%, respectively, p< 0.01). The HRQOL scores using Kidney Disease Quality of Life (KDQOL-SF) in "physical functioning (PCS)", "symptoms and problems", "effects of the kidney disease" and "burden of the kidney disease" were statistically and significantly lower in the CKD G3b group compared with the CKD G3a group (90.88 ± 11.05 vs. 89.30 ± 11.52, 88.29 ± 11.94 vs. 86.49 ± 13.45, 55.86 ± 26.40 vs. 52.10 ± 27.64, 46.56 ± 8.16 vs. 44.51 ± 9.22, respectively, P< 0.01). Furthermore, CKD G3b was associated with a lower score of physical functioning compared with G3a (regression coefficient =−1.12 [95%CI: −2.23, −0.16]) (Peng, Z., et al., 2017).

In India (Manavalan, M. 2017), HRQOL was evaluated in which the mean age of the study population was 49.14 ± 13.63 years old. There was a high proportion of illiteracy (36.3%) and unemployment (80.9%). Kidney Disease Component Summary (KDCS) showed a significant decline (p = 0.01) from CKD 3 to CKD 5D whereas MCS and PCS showed a nonsignificant decrease. There was no difference in KDCS, Physical Composite Summary (PCS), or Mental Composite Summary (MCS) scores between patients treated by hemodialysis and Continuous Ambulatory Peritoneal Dialysis (CAPD). Illiteracy and unemployment were associated with significantly lower KDCS, PCS, and MCS scores. Age ≥50 years was associated with poor PCS (29.49 ± 8.20 vs. 34.17 ± 9.99; p < 0.001). Hemoglobin <10 g/dL was associated with poor KDCS (58.93 ± 13.09 vs. 65.55 ± 13.38; p < 0.001) and PCS (29.56 ± 8.13 vs. 33.37 ± 9.82; p < 0.001). The presence of comorbidities such as diabetes and hypertension had no impact on the composite scores. KDCS, MCS, or PCS scores did not vary among patients having high serum phosphorus (≥4.5 mg/dL), low albumin (<3.5 g/dL), and elevated parathyroid hormone (≥150 pg/ml). On multiple linear regression analysis, the predictors of KDCS were unemployment ($P <$ 0.001) and illiteracy (p = 0.03). Unemployment (p < 0.001) and age (p < 0.001) were predictors of PCS whereas literacy level (p < 0.001) was predictor of MC.

In a study conducted in Singapore (Yang, F. et al., 2015), it was reported that in a multivariate regression analysis, factors found to be significantly associated with better HRQOL included: young (<45 years old) or old (>60 years old), low Charlson Comorbidity Index (CCI) (<5), high albumin (>37 g/l) and high haemoglobin (>11 g/dl) with physical component summary (PCS); long dialysis vintage (>3.5 years) with Mental Component Summary (MCS); old age, Malay ethnicity and Peritoneal Dialysis (PD) modality with Kidney Disease Component Summary (KDCS); low CCI, high albumin and high haemoglobin with EQ-5D and high albumin with Short Form 6-dimensioon (SF-6D).

In Indonesia, we found two journal papers about health-related quality of life. First Nabila, A (2015) did the research at Tebet hospital in Jakarta. According to the study, Dialysis Health Related Quality of Life (DHROL) has 13 dimensions (sense of taste, sleep disorders, mobility, fatigue, anxiety, emotional, pain, self-care, daily activities (working, shopping, study, travelling, etc), communication, social interaction, being isolated, the burdens of others). This study measured the utility and time preference of patients who used haemodialysis as a therapy. Quality Adjusted Life Years (QALY's) score was 3,35 which means patients of CKD gots 3 years of quality life. While using haemodialysis, utility score was 0,6, in which 0 means death and 1 means healthy life. Moreover, time preference score was 5,1 years, which means patients of CKD got 5 more years when they used haemodialysis as a therapy. Second, another research in Yogyakarta (In 3 big hospitals) found that in the first period, the average rates of the KDQOL-SF and FACIT for CKD patients receiving erythropoietin alpha compared to CKD patients receive erythropoietin beta were 77.24: 80.21 and 3.35: 3.49. Meanwhile, in the second period, the average rates of the KDQOL-SF and Functional Assessment Chronic Illness Therapy (FACIT) for CKD patients receiving erythropoietin alpha compared to CKD patients receiving erythropoietin beta were 80.45: 83.95 and 3.45: 3.56 (Sihombing et al., 2016).

Table 1. Summary results of journals

Country	Results
Korea	The planned dialysis group showed significantly better scores in 4 of 5 KDQOL-36 domains than did the unplanned group within 3 months after dialysis (Park JI, et al. 2015).
	The adjusted mean difference in the EQ-5D index was lower in the CKD eGFR category of 60 to 89 mL/min/1.73 m2, but not in the eGFR category of 45 to 59 mL/min/1.73 m2, compared to non-CKD (Park JI, et al., 2016).
Japan	the weights at proteinuria stage (A) 3 were significantly lower than those at A1-2. The quality-adjustment weights of patients with events such as 50% of the estimated glomerular filtration rate (GFR) declined (Okubo, R. et al., 2013).
China	The HROL scores using Kidney Disease Quality of Life (KDQOL-SF) in "physical functioning (PCS)", "symptoms and problems", "effects of the kidney disease" and "burden of the kidney disease" were statistically and significantly lower in the CKD G3b group compared with the CKD G3a group (Peng, Z., et al., 2017).
Singapore	Better HRQOL included→high albumin and high haemoglobin with EQ-5D and high albumin with Short Form 6-dimensioon (SF-6D) (Yang, F. et al., 2015).
Indonesia	Dialysis Health Related Quality of Life (DHROL), measured the utility→Quality Adjusted Life Years (QALY's) score was 3,35 which means patients of CKD gots 3 years of quality life, time preference→ was 5,1 years (Nabila, A.,2015).
	CKD patients with routine hemodialysis using erythropoietin (weather beta or alpha) was shown not significantly differ than those who did not (Sihombing, J. et al., 2017)

DISCUSSION

Chronic Kidney Disease (CKD) is defined as abnormalities of kidney structure or function, which presents for >3 months, with implications for health (Kidney International Supplements, 2013). The prevalent number of CKD has increased from 11% to 13% with the majority of stage 3 (Hill, N. et al., 2016). In study conducted in Japan study (Okubo, R. et al., 2013), it was reported that the quality-adjustment weight CKD proteinuria decreased with the increase of proteinuria. According to a study in China, the high-level CKD stage 3b (G3b) was associated with a lower score of physical functioning (PCS) compared with stage 3a (G3a) (Zhangzhe Peng, et al., 2017). The CKD stage 3b group proportions of subjects with hyperuricemia and anemia were significantly higher than those of CKD G3a group. These articles show that health care should be done carefully when the stage of CKD is progressive because the clinical features and health-related quality of life (HRQOL) are interconnected.

From six Asian countries discussed, 5 countries (Korea, China, India, Singapore, and Indonesia) used Kidney Disease Quality of Life – Short Form 36 (KDQOL). During the first time a patient was diagnosed by Chronic Kidney Disease (CKD) stage V or End Stage Renal Disease (ERSD), he / she usually had mood disturbance. According to the results of a cohort study in Korea, Beck's Depression Inventory (BDI) scored low depressive mood in a planned dialysis group (Park JI, et al., 2015). Patients with Dialysis (hemodialysis or CAPD) in India had no difference in Physical Composite Summary (PCS) or Mental Composite Summary (MCS) (Manavalan M, et al., 2017). In Indonesia, the time preference score patients with hemodialysis was 5,1. It means they would get 5 more years using it (Nabila, A., 2015). CKD patients with routine hemodialysis using erythropoietin (weather beta or alpha) was shown not significantly differ than those who did not (Sihombing, J. et al., 2017). From the description, a health care facility could provide dialysis therapy for both hemodialysis or CAPD and should manage the dose of erythropoietin needed for achieving health related quality of life CKD patient. The limitation of tis systematic review is nutrition, healthy patient behavior, family support and the environment are not included.

CONCLUSION

Health related quality of life (HRQOL) Chronic Kidney Disease (CKD) and CKD with dialysis is different in some aspect. From 10 articles were founded, we divided into 2 categories. There were HRQL in CKD patient and CKD with dialysis. The measurement of HRQOL also different, depends on what kind of tools that used. In CKD patients, when the stage of CKD is progressive, the clinical features and health-related quality of life (HRQOL) is declined. This situation not really apple to apple with dialysis patients. The routine medicine and erythropoietin could increase the HRQOL with dialysis.

REFERENCES

Centers for Disease Control and Prevention. National Chronic Kidney Disease Fact Sheet, 2017. Atlanta, GA: US Department of Health a n d Human Services, Centers for Disease Control and Prevention; 2017. https://www.cdc.gov/kidneydisease/pdf/kidney_factsheet.pdf (accessed on September 29th, 2018)

Indonesian Renal Registry (IRR). 8th Report of Indonesian Renal Registry 2015. https://www.indonesianrenalregistry.org/data/INDONESIAN%20REN % 2 0 REGISTRY%202015.pdf (accessed on August 8th, 2018)

Kementrian Republik Indonesia, 2018. Cegah dan Kendalikan Penyakit Ginjal dengan Cerdik dan Patuh. http://www.depkes.go.id/article/print/18030700007/cegah-dan-kendalikan-penyakit-ginjal-dengan-cerdik-dan-patuh.html ((accessed on August 8th, 2018).

Karimi M, Brazier Z. Health, Health-Related Quality of Life, and Quality of Life: What is the Difference ?. PharmacoEconomis. 2016;645-9.

Nabila, Anggun. Analysis of Unit Cost and Quality of Life of Chronic Kidney Disease Patients Who Use Hemodialysis as a Therapy at Tebet Hospital in 2015. Jurnal JARSI, Vol.1 no.3. 2015;124-134

Manavalan M, Majumdar A, Kumar KTH, Priyamvada PS. Assessment of health related quality of life and its determinants in patients with chronic kidney disease. 2017;37–43.

Okubo R, Kai H, Kondo M. Health-related quality of life and prognosis in patients with chronic kidney disease : a 3-year follow-up study. 2014;697–703.

Park JI, Kim M, Kim H, An JN, Lee J. Not Early Referral but Planned Dialysis I m p r o v e s Quality of Life and Depression in Newly Diagnosed End Stage Renal Disease Patients: A Prospective Cohort Study in Korea. 2015;1–12. Available in: http://dx.doi.org/10.1371/journal.pone.0117582

Park JI, Baek H, Jung HH. CKD and Health-Related Quality of Life: The Korea National Health and Nutrition Examination Survey. Am J Kidney Dis [Internet]. 2018;67(6):851–60. Available in: http://dx.doi.org/10.1053/j.ajkd.2015.11.005

Peng Z, Wang J, Yuan Q, Xiao X, Xu H, Xie Y, et al. Clinical features and CKD-related   q u a l i t y of life in patients with CKD G3a and CKD G3b in China: results from the Chinese Cohort Study of Chronic Kidney Disease. 2017;1–9.

Perwitasari, D.A. 2013, "PUK15 - Health-Related Quality of Life of Haemodialysis Patients in Indonesia", *Value in Health,* vol. 16, no. 7, pp. A699-A699.

Sihombing J, Hakim L, Andayani TM, Irijanto F. Quality of life of chronic kidney disease patients with routine hemodialysis in general hospitals in Sleman Yogyakarta. Int J Pharm Pharm Sci 2017;9(2):213-216

Tajima R, Kondo M, Kai H. Measurement of health-related quality of life in patients with chronic kidney disease in Japan with EuroQol (EQ-5D). 2010;340–8.

Walters SJ. Quality of Life Outcomes in Clinical Trials and Health-Care Evaluation A Practical Guide to Analysis and Interpretation. 2009. Wiley.

Yang, F. Griva, K, Vathsala A, et al. Health-related quality of life of Asian patients with end-stage renal disease (ESRD) in Singapore. 2015;2163–71.

Hill, N. R., Fatoba, S. T., Oke, J. L., Hirst, J. A., O'Callaghan, C. A., Lasserson, D. S., & Hobbs, F. D. R. (2016). Global Prevalence of Chronic Kidney Disease – A Systematic Review and Meta-Analysis. PLoS ONE, 11(7),e0158765. http://doi.org/10.1371/journal.pone.0158765. Chapter 1: Definition and classification of CKD. (2013). Kidney International Supplements, 3(1), 19–62. http://doi.org/10.1038/kisup. 2012.