ASSOCIATION BETWEEN THE USAGE OF TRADITIONAL AND COMPLEMENTARY MEDICINE (T&CM) AND SOCIODEMOGRAPHIC FACTORS AMONG HEMODIALYSIS PATIENTS IN HPUSM

NUR AMALIN BT ZAINUDDIN

SCHOOL OF HEALTH SCIENCES

UNIVERSITI SAINS MALAYSIA

2026

ASSOCIATION BETWEEN THE USAGE OF TRADITIONAL AND COMPLEMENTARY MEDICINE (T&CM) AND SOCIODEMOGRAPHIC FACTORS AMONG HEMODIALYSIS PATIENTS IN HPUSM

by

NUR AMALIN BINTI ZAINUDDIN

Dissertation submitted in partial fulfillment

of the requirements for the degree

of Bachelor of Health Science (Honours) (Dietetics)

June 2026

ACKNOWLEDGEMENTS

First and foremost, I would like to express my deepest gratitude to Allah SWT for His blessings, guidance, strength, and ease throughout the completion of my study. I would also like to sincerely thank my supervisor, Dr Wan Faizah, for the continuous guidance, advice, and support given during the preparation of this study.

Next, I would also like to express my sincere appreciation to AP Dr. Fadhlina Zakaria and Dr Mohd Tawfeq Mohd Noor, the authors of the previous study, for kindly approving my request to use their questionnaire and for providing a valuable reference that guided the development of this research. I am also grateful for the HPUSM patients who willingly participated and contributed to this study, as well as the HPUSM staff who provided assistance through the data collection process.

In addition, my appreciation is also extended to my beloved parents for their endless prayers, love, and support, which have been a source of strength for me. A special thanks goes to my friend, Hadifah, for working together with me during the data collection process. Finally, I would like to express my deepest appreciation to all individuals who have contributed their time, effort, and support towards the successful completion of this study.

TABLE OF CONTENTS

CERTIFICATE iii
DECLARATION iv
ACKNOWLEDGEMENTS v
LIST OF TABLES ix
LIST OF FIGURES x
LIST OF ABBREVIATIONS xi
ABSTRAK xii
ABSTRACT xiv
CHAPTER 1: INTRODUCTION 1
1.1 BACKGROUND OF STUDY 1
1.2 PROBLEM STATEMENT 3
1.3 RESEARCH QUESTIONS 5
1.4 STUDY OBJECTIVES 6
1.5 STUDY HYPOTHESIS 7
1.6 SIGNIFICANCE OF STUDY 8
CHAPTER 2: LITERATURE REVIEW 9
2.1 TYPES OF TRADITIONAL AND COMPLEMENTARY MEDICINE 9
2.2 CHRONIC KIDNEY DISEASE 11
2.3 ASSOCIATION BETWEEN T&CM AND SOCIODEMOGRAPHIC FACTORS 12
2.4 CONCEPTUAL FRAMEWORK 15
CHAPTER 3: METHODOLOGY 17
3.1 STUDY DESIGN 17
3.2 STUDY LOCATION 17
3.3 TARGET POPULATION 17
3.4 SELECTION CRITERIA 18
3.4.1 INCLUSION CRITERIA 18
3.4.2 EXCLUSION CRITERIA 18
3.5 SAMPLING METHOD 18
3.6 SAMPLE SIZE CALCULATION 19
3.7 STUDY INSTRUMENTS 20
3.8 DATA COLLECTION 21

3.9 DATA ANALYSIS 21
3.10 ETHICAL CLEARANCE 23
3.10.1 Subject vulnerability 23
3.10.2 Declaration of absence of conflict of interest 23
3.10.3 Privacy and confidentiality 23
3.10.4 Community sensitivities and benefits 24
3.10.5 Honorarium and Incentives 24
CHAPTER 4: RESULTS 25
4.1 OVERVIEW 25
4.2 SOCIODEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF PARTICIPANTS 25
4.2.1 PRESENCE OF COMORBIDITIES IN PARTICIPANTS 28
4.3 PREVALENCE OF T&CM USAGE 29
4.4 TYPES AND REASONS FOR USING T&CM 30
4.4.1 TYPES OF T&CM USED 30
4.4.2 REASONS FOR USING T&CM 31
4.5 ASSOCIATION BETWEEN T&CM USAGE AND SOCIODEMOGRAPHIC FACTORS 32
4.6 ASSOCIATION BETWEEN T&CM USAGE AND PRESENCE OF COMORBIDITIES 35
CHAPTER 5: DISCUSSION 36
5.1 OVERVIEW 36
5.2 PREVALENCE OF T&CM USAGE AMONG HEMODIALYSIS PATIENTS IN HPUSM 37
5.3 TYPES OF T&CM USED BY HEMODIALYSIS PATIENTS AT HPUSM 39
5.4 REASONS FOR USING T&CM 41
5.5 ASSOCIATION BETWEEN T&CM USAGE AND SOCIODEMOGRAPHIC FACTORS 42
5.5.1 AGE 43
5.5.2 GENDER 44
5.5.3 ETHNICITY 44
5.5.4 HOUSEHOLD INCOME 44
5.5.5 MARITAL STATUS 45
5.5.6 EDUCATION STATUS 46
5.5.7 EMPLOYMENT STATUS 46

5.6 PRESENCE OF COMORBIDITIES 47
5.7 IMPLICATIONS FOR CLINICAL PRACTICE 48
5.8 STRENGTHS AND LIMITATIONS 49
5.9 CONCLUSION 51
REFERENCES 53
APPENDICES 56
APPENDIX A: QUESTIONNAIRE (MALAY VERSION) 56
APPENDIX B: PERMISSION TO USE QUESTIONNAIRE 63
APPENDIX C: APPROVAL FROM OBB 64
APPENDIX D: CONSENT FORM (MALAY VERSION) 66
APPENDIX E: JEPeM APPROVAL LETTER 71
APPENDIX F: EDUCATIONAL MATERIALS FOR PARTICIPANTS (MALAY VERSION) 73

LIST OF TABLES

Table 4. 1 Sociodemographic and Clinical Characteristics of Hemodialysis Patients in HPUSM (n=85) 25

Table 4. 2 Presence of Comorbidities among Hemodialysis Patients in HPUSM (n=85) (100.0%) 28

Table 4. 3 Types of T&CM Used among Hemodialysis Patients in HPUSM (n=51) 30

Table 4. 4 Reasons for T&CM Usage among Hemodialysis Patients in HPUSM (n=51) 31

Table 4. 5 Association between T&CM usage and Sociodemographic Factors among Hemodialysis Patients in HPUSM 32

Table 4. 6 Association between T&CM Usage and Presence of Comorbidities among Hemodialysis Patients in HPUSM 35

LIST OF FIGURES

Figure 2. 1: Conceptual framework 15

Figure 4. 1 Prevalence of T&CM Usage Among Hemodialysis Patients in HPUSM (n=85) (100.0%) 29

LIST OF ABBREVIATIONS

CKD: Chronic Kidney Disease

eGFR: Estimated Glomerular Filtration Rate

ESKD: End-Stage Kidney Disease

HD: Hemodialysis

HPUSM: Hospital Pakar Universiti Sains Malaysia

IBM SPSS: International Business Machines Statistical Package for Social Sciences

IQR: Interquartile Range

JEPeM: Jawatankuasa Etika Penyelidikan Manusia

KDIGO: Kidney Disease: Improving Global Outcomes

SD: Standard Deviation

T&CM: Traditional and Complementary Medicine

USM: Universiti Sains Malaysia

WHO: World Health Organization

ABSTRAK

Perubatan Tradisional dan Komplementari (T&CM) sering digunakan oleh pesakit yang menghidap penyakit kronik untuk menyokong pemulihan dan penjagaan kendiri, termasuk pesakit yang menjalani hemodialisis. Walaupun T&CM sering digunakan untuk menyokong kesejahteraan dan pengurusan gejala, penggunaannya dalam kalangan pesakit hemodialisis boleh menimbulkan kebimbangan klinikal, terutamanya berkaitan keselamatan, interaksi rawatan, serta penggunaan produk herba atau suplemen pemakanan tanpa pemantauan. Kajian ini bertujuan untuk menentukan kelaziman penggunaan T&CM, jenis dan sebab penggunaan T&CM, serta menilai hubungannya dengan faktor sosiodemografi dalam kalangan pesakit hemodialisis di HPUSM. Kajian keratan rentas telah dijalankan yang melibatkan 85 orang pesakit hemodialisis yang dipilih melalui kaedah persampelan mudah. Data dikumpulkan menggunakan borang soal selidik yang telah disahkan dan dianalisis menggunakan IBM SPSS versi 28.0. Statistik deskriptif digunakan untuk merumuskan ciri-ciri peserta, kelaziman, jenis dan sebab penggunaan T&CM, manakala ujian Chi-square Pearson dan ujian Fisher's Exact digunakan untuk menilai hubungan antara pemboleh ubah. Dapatan kajian menunjukkan bahawa 60.0% peserta pernah menggunakan T&CM, dengan kebanyakan pengguna melaporkan penggunaan sebelum memulakan dialisis. Ubat herba (45.1%) merupakan jenis T&CM yang paling kerap digunakan, diikuti oleh suplemen pemakanan (39.2%), bekam (37.3%) dan urutan (35.3%). Sebab utama penggunaan T&CM adalah untuk meningkatkan keyakinan (49.0%), merawat penyakit buah pinggang secara langsung menggunakan perubatan tradisional (41.2%), meningkatkan kesejahteraan fizikal (33.3%), dan meningkatkan keupayaan tubuh untuk merawat penyakit lain (31.4%). Walau bagaimanapun, tiada hubungan yang signifikan ditemui antara penggunaan T&CM dengan

faktor sosiodemografi atau kehadiran komorbiditi. Kajian ini menunjukkan bahawa penggunaan T&CM adalah kerap dalam kalangan pesakit hemodialisis di HPUSM. Dapatan kajian ini menekankan keperluan terhadap komunikasi terbuka, pendidikan yang sensitif terhadap budaya pesakit, serta penilaian rutin terhadap penggunaan T&CM dalam penjagaan klinikal bagi menggalakkan pengurusan pesakit yang lebih selamat.

ABSTRACT

Traditional and complementary medicine (T&CM) is frequently utilized by patients with chronic diseases to support recovery and self-care, including those undergoing hemodialysis. Although T&CM is often used to support well-being and symptom management, its use among hemodialysis patients may raise clinical concerns, particularly regarding safety, treatment interactions, and the unsupervised use of herbal products or dietary supplements. This study aimed to determine the prevalence of T&CM usage, types, and reasons for T&CM use, and to examine its association with sociodemographic factors among hemodialysis patients at HPUSM. A cross-sectional study was conducted involving 85 hemodialysis patients selected via convenience sampling. Data were collected using a validated questionnaire and analysed using IBM SPSS version 28.0. Descriptive statistics were used to summarise participant characteristics, prevalence, types, and reasons for T&CM use, while the Pearson Chi-square test and Fisher's Exact test were used to examine associations between variables. The findings showed that 60.0% of participants had used T&CM, with most users reporting use before initiating dialysis. Herbal medicine (45.1%) was the most commonly used type of T&CM, followed by dietary supplements (39.2%), cupping therapy (37.3%), and massage (35.3%). The main reasons for using T&CM were to increase confidence (49.0%), to treat kidney disease directly using traditional medicine (41.2%), to improve physical well-being (33.3%), and to boost the body's ability to treat other illnesses (31.4%). However, no significant association was found between T&CM use and sociodemographic factors or the presence of comorbidities. This study indicates that T&CM use is common among hemodialysis patients in HPUSM. The findings highlight the need for

open communication, culturally sensitive patient education, and routine assessment of T&CM use in clinical care to promote safer patient management.

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF STUDY

Traditional and complementary medicine (T&CM) refers to a broad range of health practices and products that are typically outside the conventional medicine system, and its use is substantial among the general population (Lee et al.,2022). Specifically, traditional medicine emphasizes nature-based remedies and holistic, personalized approaches to restore balance of mind, body, and environment. Meanwhile, complementary medicine refers to additional healthcare practices that are not part of a country's mainstream medicine (WHO,2023). T&CM constitutes medical practices and products that are outside mainstream conventional medicine and include herbal medicine, dietary supplements, and other biologically based therapies. T&CM is highly prevalent among hemodialysis patients with end-stage kidney disease (ESKD). Individuals often integrate these therapies with conventional medical treatments to fulfill their health care needs, due to their belief that it will support recovery and self-care (Sheik Adam et al.,2024).

Globally, the prevalence of T&CM usage has been on the increase. According to the World Health Organization (2023), traditional medicine is used in 170 countries, based on a 2019 WHO report. Many countries recognize traditional medicine as a valuable source of health care and have taken steps to integrate practices, products, and practitioners into their national systems. The National Health Interview Survey (NHIS) revealed that more than one-third, or 36.7% of U.S. adults reported using at least one complementary health approach in 2022. The figure represents an almost twofold increase compared to 19.2% of adults who stated in the survey that they used traditional complementary medicine in 2002 (NIH,2024).

In Morocco, among patients with varied kidney diseases, approximately 50.7% used herbal medicine, and the common reasons were belief in effectiveness, easy accessibility, and low price (Touiti et al.,2020). This extensive use reflects how most populations view T&CM's effectiveness, accessibility, and cultural acceptability.

The application of T&CM is also prevalent in Malaysia. A study involving Malaysian patients on chronic hemodialysis from across the country reported that 64.7% were using T&CM, primarily herbal medicines and supplements, but most did not inform their doctors about it (Zakaria et al.,2021). Studies in Malaysia have consistently revealed that such therapies as T&CM are popularly used throughout the country. The most common methods that people from different groups of population have resorted to are herbal preparations, dietary supplements, and traditional massage (Nik Yusof Fuad et al.,2020; Syed Jamaludin et al.,2024; Wahab et al.,2021). Following this pattern, the consumption of T&CM has similarly expanded over the last few years, with herbal treatments being mentioned as the main part of T&CM services in Malaysia (Zakaria et al.,2021). The motives for which these patients take T&CM are diverse. The usage of T&CM is prevalent among patients with chronic or terminal disease (Mohit et al.,2025). These include diseases such as cancer, heart disease, and kidney disease. The chronicity of diseases and their limited options for cure by conventional medicine often led people to turn to T&CM (Zakaria et al.,2021). This trend explains the importance of examining T&CM usage in the Malaysian healthcare system, especially among high-risk populations such as kidney disease patients.

1.2 PROBLEM STATEMENT

Patients with chronic kidney disease undergoing long-term hemodialysis often experience severe symptoms, high treatment burdens, and reduced quality of life. In Malaysia, the prevalence of T&CM usage remains common among patients with chronic illness, including those receiving hemodialysis for symptom control or to improve well-being (Zakaria et al.,2021).

The concurrent use of T&CM presents severe clinical risks, particularly herbal medication, which poses a significant threat to end-stage kidney disease (ESKD) patients receiving hemodialysis. The impaired excretory function of ESKD patients often leads to the accumulation of potentially harmful herbal constituents. Herbal and traditional medicines have been increasingly recognized as potential contributors to kidney injury in patients with impaired renal function because of the presence of nephrotoxic constituents, unpredictable pharmacokinetics, and poor excretory clearance that worsen volume overload, electrolyte imbalance, and progression of renal disease (Yang et al.,2018; Claure & Espinosa,2021). Furthermore, several herbs are well known to be associated with worsening kidney disease and might induce harm to consumers with kidney disease (Zakaria et al.,2021). Therefore, this highlights the need to examine the prevalence of T&CM usage among hemodialysis patients in Malaysia and how sociodemographic factors may influence these practices.

Despite these concerns, some plant-based substances, such as silymarin, curcumin, resveratrol, and quercetin, have shown potential benefits in reducing oxidative stress and inflammation among dialysis patients (Asgharpour & Alirezaei,2021). However, high-quality clinical evidence regarding safe dosage, exact drug interactions, and specific patient-related risks within dialysis regimens such as residual kidney function, remains critically

scarce and poorly understood. Therefore, T&CM usage among hemodialysis patients requires further investigation, particularly in relation to its prevalence, types of T&CM used, reasons for use, and associated sociodemographic factors. Understanding these patterns is important to support safer patient counselling and improve awareness among healthcare professionals involved in the care of hemodialysis patients.

Currently, there is a critical shortage of institution-specific baseline data at Hospital Pakar Universiti Sains Malaysia (HPUSM) regarding which sociodemographic subgroups are most inclined to utilize T&CM. Without objective empirical evidence on local prevalence and associated factors, clinicians and nephrologists at HPUSM cannot accurately identify high-risk patient groups, individualize counselling, or design targeted educational interventions. This study directly addresses this regional knowledge gap by assessing prevalence, types, and reasons for T&CM use, as well as its association with sociodemographic factors among hemodialysis patients in HPUSM, thereby establishing a foundation for safer, collaborative, and culturally sensitive patient care.

1.3 RESEARCH QUESTIONS

1. What is the prevalence of T&CM usage among hemodialysis patients in HPUSM?
2. What are the types of T&CM modalities utilized and the underlying reasons for using T&CM among hemodialysis patients in HPUSM?
3. Is there an association between T&CM usage and selected sociodemographic factors (including age, gender, ethnicity, household income, marital status, education level, and employment status) or the presence of comorbidities among hemodialysis patients in HPUSM?

1.4 STUDY OBJECTIVES

A) General objective:

To determine the prevalence of T&CM usage and its association with sociodemographic factors and the presence of comorbidities among hemodialysis patients in Hospital Pakar Universiti Sains Malaysia (HPUSM).

B) Specific objective:

1. To assess the prevalence of T&CM usage among hemodialysis patients in HPUSM.
2. To identify the types of T&CM modalities utilized and the underlying reasons for their usage among hemodialysis patients in HPUSM.
3. To determine the association between T&CM usage and selected sociodemographic factors as well as the presence of comorbidities among hemodialysis patients in HPUSM.

1.5 STUDY HYPOTHESIS

Null hypothesis (H_0):

There is no association between the T&CM usage and selected sociodemographic factors among hemodialysis patients in HPUSM.

Alternative hypothesis (H_A):

There is an association between T&CM usage and selected sociodemographic factors among hemodialysis patients in HPUSM.

Null hypothesis (H_0):

There is no significant association between T&CM usage and the presence of comorbidities among hemodialysis patients in HPUSM.

Alternative hypothesis (H_A):

There is a significant association between T&CM usage and the presence of comorbidities among hemodialysis patients in HPUSM.

1.6 SIGNIFICANCE OF STUDY

This study is significant because it addresses a gap in regional evidence regarding the prevalence of T&CM usage among hemodialysis patients, which is currently limited in Malaysia. These findings are important to understand patient behaviour beyond medical treatment alone.

Furthermore, the findings will help healthcare providers, particularly nephrologists and dietitians, individualize patient counseling and education. With such knowledge about the populations most at risk for T&CM usage, healthcare teams are better equipped to engage in more informed conversations, improve open disclosure, and provide balanced advice that balances medical caution with cultural empathy. This will avoid harmful interactions and enable safer patient choices.

At a more comprehensive scale, the research will add to the expanding evidence regarding T&CM in the management of chronic diseases in Malaysia. The results may guide future research, support hospital policy development, and strengthen multidisciplinary care for hemodialysis patients. At the hospital level, the findings of this study may support HPUSM in strengthening policies and clinical practices related to the routine assessment of T&CM usage among hemodialysis patients. For example, the Nephrology Unit may consider including questions on herbal medicine, dietary supplements, and other T&CM practices as part of routine patient history-taking or dialysis counselling. Lastly, the study hopes to contribute to safer patient management by encouraging open communication about T&CM use alongside conventional treatment.

CHAPTER 2: LITERATURE REVIEW

2.1 TYPES OF TRADITIONAL AND COMPLEMENTARY MEDICINE

Traditional and Complementary Medicine (T&CM) comprises a handful of different modalities that, individually, provide unique ways of achieving health and a good life. These include the whole medical system, manipulative and body-based practices, biologically based therapies that use natural substances, and mind–body medicine, which involves methods for the holistic integration of the mental and physical aspects of the person. In sum, these modalities constitute a wide and holistic health framework (WHO,2023).

The whole medical system, such as traditional Chinese medicine, Ayurveda, and traditional Malay medicine, is being practiced widely. Traditional Chinese medicine clinics offering acupuncture, herbal medicine, and cupping are registered under the Traditional and Complementary Medicine Act 2016 to facilitate practitioner competency and patient safety (Marican et al.,2021). Pain, stress, infertility, and metabolic disorders are managed by widely practiced traditional Chinese medicine interventions such as acupuncture and moxibustion. Evidence in Malaysian hospitals has shown that acupuncture can improve pain management and quality of life in individuals with chronic illness, while Malay traditional medicine via herbal bath and massage is routinely performed post-delivery to promote recovery. Although evidence of their holistic benefits exists, standardization of practice and scientific confirmation for broader clinical use are challenging (Marican et al.,2021).

Manipulative and body-based interventions are among the most common traditional Malaysian therapies. Some of the therapies include Malay traditional massage, acupressure, reflexology, and chiropractic treatment. Malay massage focuses on muscle relaxation, blood

circulation, and inner tranquility, whereas reflexology is commonly demanded by city residents in order to alleviate fatigue and promote sleep (Liu et al.,2024). Malaysian cancer and hemodialysis patients were discovered in research to have their anxiety, muscle tension, and pain alleviated by acupressure and reflexology (Liu et al.,2024). Chiropractic and osteopathic methods, while not as conventional, are increasingly used in private healthcare centers for musculoskeletal pain. Less conventional but quite safe, results are contingent on practitioner skill and treatment frequency. These therapies are more accurately described as complementary therapies, which supplement comfort and cure when applied alongside conventional medical care (Liu et al.,2024).

Biologically based therapy is common, especially in Malaysia, due to the fact that the country has high biodiversity and a rich herbal culture. Common indigenous plants employed are Tongkat Ali (*Eurycoma longifolia*), a plant that enhances vitality and male reproductive health, Misai Kucing (*Orthosiphon stamineus*), for kidney and urinary health, and Pegaga (*Centella asiatica*), for wound healing and dermal health (Marican et al.,2021). These herbs also appear in conventional markets and contemporary supplement forms, with strong consumer faith in natural remedies. However, studies have shown inconsistent quality control and potential herb-drug interaction, especially with patients taking prescribed and herbal medications (Knecht et al.,2020). Most Malaysians also do not report the use of herbal products to their doctors, thereby compromising safety. In spite of the cultural relevance and medical benefit of biologically based therapies, increased research, product control, and public education are required in order to allow safe use and incorporation into evidence-based healthcare (Knecht et al.,2020).

Lastly, mind-body medicine also receives significant attention in Malaysia for wellness care. Its various well-being and rehabilitation programs include relaxation therapy, tai chi, yoga, and qigong. Qigong and tai chi are two Chinese traditional medicine practices that have been offered in community centers and geriatric care to improve balance, flexibility, and mental calmness (Dong et al.,2024). Moreover, mindfulness-based stress reduction and yoga were found to be effective in reducing depression, anxiety, and fatigue among Malaysia's medical students and professionals (Bandealy et al.,2021).In addition, a six-month yoga intervention demonstrated significant improvements in physical and psychological quality-of-life domains among CKD patients, suggesting that yoga may serve as a supportive complementary approach alongside conventional CKD management (Pandey et al., 2017) These therapies also simply manifest Malaysia's multi-religious health philosophy, which states that body, mind, and environment should be integrated into a system for ultimate well-being. Mind-body treatments are non-invasive, inexpensive, and easily adapted into preventive health hence, they can be an invaluable addition to hospital rehabilitation and community wellness programs (Dong et al.,2024).

2.2 CHRONIC KIDNEY DISEASE

Chronic kidney disease (CKD) is characterized by abnormalities of kidney structure or function that are present for more than three months and have health implications. According to the Kidney Disease: Improving Global Outcomes (KDIGO) 2024 guideline, CKD is both defined and staged by eGFR and albuminuria categories, with recognition that albuminuria is not only a marker but also a cause of disease progression. CKD affects a substantial proportion of adults globally and has a dominant impact on cardiovascular disease, premature mortality, and health-care burden. Across populations, the prevalence of

CKD is widespread and rising, whereas big global burden of disease studies show accelerating trends of mortality and disability-adjusted life years attributable to CKD, particularly in lower-middle socio-demographic index countries (Chen & Wu,2021).

From the pathophysiologic viewpoint, CKD progression is driven by chronic glomerular and tubular injury, maladaptive repair with interstitial fibrosis, nephron loss, and systemic factors such as hypertension, diabetes, inflammation, uremic toxins, and metabolic disturbance. The major influences of CKD are primary glomerular disease, hypertension, and diabetes mellitus. The KDIGO (2024) guideline puts greater emphasis on early detection with the use of eGFR and albuminuria, risk-stratification, and the use of evidence-based treatment to slow progression.

To conclude, CKD is a common, high-risk illness whose prognosis can be greatly optimized with early detection of eGFR and albuminuria pattern, intense risk stratification, and early initiation of reno-protective treatments together with conventional approaches such as blood pressure or diabetes management and lifestyle optimization. Implementation of guidelines such as KDIGO's is crucial, and investigation into new therapies, biomarkers, and models of care remains high on the agenda. Therefore, patients with CKD, particularly those undergoing hemodialysis, represent a clinically vulnerable group in whom T&CM usage should be carefully assessed due to possible safety concerns and treatment interactions.

2.3 ASSOCIATION BETWEEN T&CM AND SOCIODEMOGRAPHIC FACTORS

Several studies have shown that sociodemographic factors have a significant association with T&CM usage in hemodialysis patients. Zakaria et al. (2021) found that age, educational level, and employment status are associated with T&CM usage. It is concluded that younger patients were more likely to utilize T&CM compared to older patients. The age

of those utilizing T&CM was approximately 51 years on average. This suggests that younger hemodialysis patients are more open to alternative or complementary treatments. Education was another important factor, in which patients with higher education were far more likely to use T&CM. Those who had only a primary education were not as likely to use it. Taking the same trends, working patients utilized T&CM more than unemployed patients, and unemployment was related to the lower likelihood of T&CM uptake. Income level and gender, but not to a significant extent, were not identified with relationships with T&CM usage in this sample.

In a study of maintenance hemodialysis patients in Cameroon, usage of T&CM was overwhelmingly common. (Mambap et al.,2022) In that study, older hemodialysis patients who have been on dialysis for more years were associated with more T&CM use, indicating that patients with longer durations on dialysis are more likely to use T&CM. Other sociodemographic factors, such as sex, income, or education, however, were less significantly associated in this study.

In a study by Abdullah et al. (2018) in Malaysia, it was concluded that age, education level, place of residence, and gender were significantly associated with the use of T&CM. Specifically, older adults aged 65 years or older, higher education level, staying in urban areas and females are more likely to use T&CM.

The association between sociodemographic characteristics and the usage of T&CM in chronic disease patients has been widely covered in the literature. Age is among the most important variables. Younger Malaysian hemodialysis patients were more likely to use T&CM compared to older patients, and the mean age between users and non-users was significantly different (Zakaria et al.,2021).

Furthermore, education levels have also been significantly associated with T&CM usage. Those with only primary education are less likely to use T&CM compared to those with higher education (Zakaria et al.,2021). In addition, Abdullah et al. (2018) found that those with higher educational levels are most likely to use T&CM. However, the weakness of this correlation could vary interculturally because educational levels also intersect with health attitudes and cultural acceptance of traditional practices.

Finally, socioeconomic status, which usually represents employment status or income level, is a significant factor for T&CM usage. In a study by Zakaria et al. (2021), it was found that most participants had a household income of less than RM3000 per month, and most participants were unemployed. Nevertheless, although socioeconomic status was not considered in this study, lower education level and older age might reflect low socioeconomic status, which influences the usage of T&CM rather than conventional medicine. This pattern of T&CM usage might also be influenced by cultural backgrounds and shared beliefs of the affected individuals (Abdullah et al.,2018). These findings highlight the need for more research to clarify how sociodemographic diversity, particularly in multiethnic nations like Malaysia, shapes patterns of T&CM usage among hemodialysis patients.

2.4 CONCEPTUAL FRAMEWORK

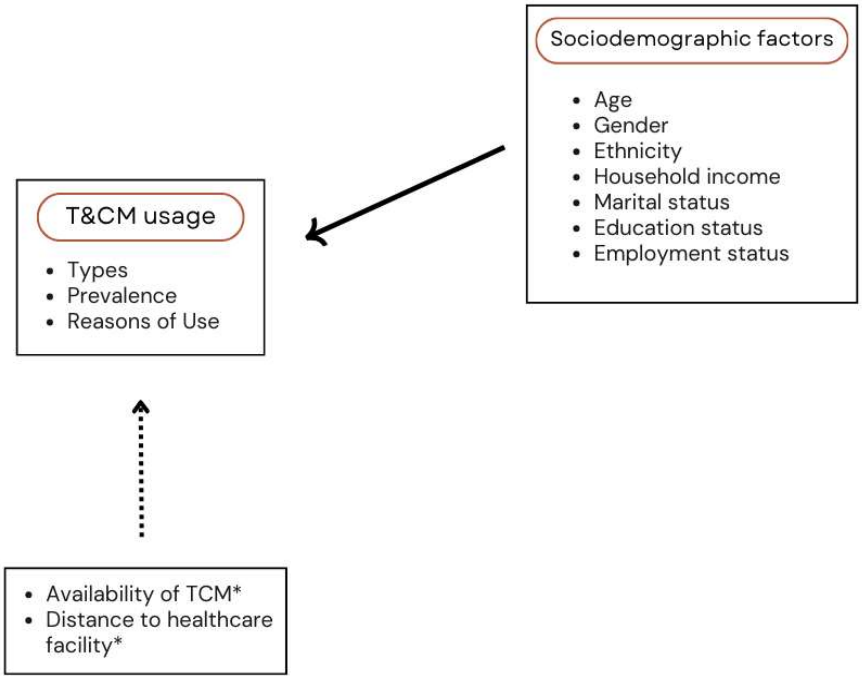


Figure 2. 1: Conceptual framework

*This variable is not included in this study

The conceptual framework highlights the key factors that influence a person's decision to use T&CM. Sociodemographic factors like age, gender, ethnicity, household income, marital status, education level, and employment status are major determinants of an individual's tendency to use T&CM (Zakaria et al.,2021). These factors may affect one's beliefs, cultural practices, financial accessibility, and general openness to T&CM. For example, cultural norms related to ethnicity or differences in education level may influence a person's awareness, acceptance, and trust in T&CM therapies (Ng et al.,2024).

Moreover, certain environmental factors like the availability of T&CM services and the distance to healthcare facilities could have a subtle effect on T&CM usage. If T&CM providers are at hand or conventional healthcare facilities are far away, people could be more willing to use T&CM as a part of their health-seeking behaviour.

The dependent variable, usage of T&CM, is conceived as the types of T&CM used, the prevalence of T&CM usage in the population, and the reasons for which individuals seek such therapies. This framework, through investigating the interactions between sociodemographic, clinical, and accessibility-related factors, helps to understand the driving forces behind T&CM usage. Such knowledge can be used to facilitate the integration of safe and effective T&CM practices in healthcare settings, as well as for planning and patient education purposes (WHO,2023).

CHAPTER 3: METHODOLOGY

3.1 STUDY DESIGN

The study applied a cross-sectional study design. This design was suitable for assessing the association between the T&CM usage and sociodemographic factors among hemodialysis patients at HPUSM. Apart from its simplicity and practicability, it gave a general picture of patients' T&CM use and sociodemographic factors without placing a burden or interrupting their routine. Therefore, the study was productive and time efficient (Zakaria et al.,2021).

3.2 STUDY LOCATION

The study was conducted in Hospital Pakar Universiti Sains Malaysia, Kubang Kerian, Kelantan. The study was conducted at the Hemodialysis Unit of HPUSM. HPUSM was selected because it provides hemodialysis services and has access to the target population of this study. As HPUSM is located in Kelantan, it may involve patients who had a high possibility of being exposed to T&CM usage, as it is well known for its strong cultural practices and higher use of T&CM compared to more urbanized areas. Research found that 43.1% of participants with chronic disease in Kelantan used T&CM (Roslinda et al.,2020).

3.3 TARGET POPULATION

This study focused on outpatient and inpatient hemodialysis patients in Hospital Pakar Universiti Sains Malaysia, Kubang Kerian, Kelantan, aged between 18 and 90 years old and able to communicate verbally.

3.4 SELECTION CRITERIA

3.4.1 INCLUSION CRITERIA

a) Hemodialysis patients aged 18 to 90 years

b) Able to communicate verbally

c) Able to give informed consent

3.4.2 EXCLUSION CRITERIA

a) Patients with a history of or currently undergoing peritoneal dialysis

3.5 SAMPLING METHOD

The study used a convenience sampling method, in which participants were chosen because they could be readily accessible and were available at a given time. Patients who met the inclusion criteria were included. Prior to the start of the study, all patients received details about the research and were requested to sign a consent form to indicate their willingness to participate. The questionnaire was given in hard copy and in the Malay language. Subsequently, the questionnaire was completed either by self-completion or through interview assistance regarding the usage of T&CM along with their sociodemographic information. This approach was chosen due to feasibility within the study timeline and the accessibility of patients in a clinical setting. Although convenience sampling may limit the generalizability of findings, it was considered appropriate for this study because the sample was drawn from a specific and accessible clinical population. However, findings from

convenience samples should be interpreted within the population from which the sample was recruited rather than being generalized to the wider population (Andrade,2021).

3.6 SAMPLE SIZE CALCULATION

In this study, the formula that was used for the sample size calculation was a single-proportion formula to determine the prevalence of the study population.

$$n = \left[\frac{Z}{\Delta}\right]^2 p(1-p)$$

n = sample size

Z = value representing the desired confidence level

Δ = precision

P = anticipated population proportion

The sample size was calculated using the single proportion formula with a 95% confidence interval, which is the Z-score of 1.96, a precision of 0.1, and prevalence of T&CM usage of 24.6% (0.246) based on the study of Jeon et al. (2019). To account for a potential drop-out rate, data entry errors, or outliers, an additional 20% was added to the calculated sample size. Therefore, the final targeted sample size for this study is 85 participants.

$$n = \left[\frac{1.96}{0.1}\right]^2 0.246(1-0.246)$$

n = 71 participants

Considering a 20% drop-out, the sample size is

n = 71 + (20% x 71)

= 71 + 14

= 85 participants

3.7 STUDY INSTRUMENTS

The study used a validated questionnaire from a previous study (Zakaria et al.,2021) in which the survey was utilized to obtain information about sociodemographic factors and T&CM usage. Sociodemographic data, including age, sex, ethnicity, and duration of hemodialysis, were obtained through this questionnaire. This validated questionnaire was divided into 3 categories, containing 20 questions on sociodemographic, the use of T&CM, and factors associated with its usage (Appendix A).

The first part of the questionnaire consisted of questions about sociodemographic factors such as gender, income, marital status, education level, race, and comorbidities. The second part contained questions about the types of T&CM used, the reasons for use, frequency of usage of T&CM, how much it costs, and how T&CM affected them in both positive and negative effect. The last part consisted of questions about the acknowledgement of T&CM usage to their doctors or health practitioners, how the doctors reacted to it, and the reasons for not informing doctors, accordingly (Zakaria et al.,2021). Although the original questionnaire included additional items, the present study analysed only the variables relevant to the study objectives.

3.8 DATA COLLECTION

This cross-sectional study was carried out among hemodialysis patients in HPUSM to determine the prevalence and contributing factors to T&CM usage. A total of 85 participants were selected through convenience sampling. Participants received a hard copy questionnaire and completed it during their routine hemodialysis sessions at their convenience. Ethical approval was obtained from JEPeM-USM, and permission was obtained from the relevant HPUSM authority before data collection. Informed consent was secured from all participants before data collection began.

Interview-administered or self-administered questionnaires were completed by participants who met the criteria and agreed to participate in the study. Each questionnaire took approximately 15 to 20 minutes to complete. All 85 recruited participants completed the questionnaire and were included in the final analysis. All responses were reviewed for completeness. This information was recorded in a protected database available solely to the researcher.

3.9 DATA ANALYSIS

All collected data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 28.0 with descriptive and inferential methods. The analysis began with cleaning and preparing data to ensure accuracy. Any incomplete responses or those that did not meet the inclusion criteria were removed before further analysis.

Descriptive statistics were used to summarise the participants' characteristics. The descriptive methods included frequency distribution tables and graphs for categorical data,

and for numerical data, results were presented as mean and standard deviation, whereas skewed numerical data were presented as median and interquartile range. Next, the inferential methods included Pearson Chi-square tests for associations between the usage of T&CM and selected sociodemographic and other variables. Fisher's exact test was used when the expected cell count assumptions of the Pearson Chi-square test were not met. All hypotheses were tested at the significance level of $p<0.05$.

The dependent variables were T&CM usage, categorised as users and non-users. Independent variables were sociodemographic factors (age, gender, ethnicity, marital status, household income, employment status and educational status) and the presence of comorbidities. The types of T&CM used and the reasons for T&CM use among hemodialysis patients were summarised descriptively.

3.10 ETHICAL CLEARANCE

This study was conducted after ethical approval was obtained from the Jawatankuasa Etika Penyelidikan Manusia (JEPeM-USM), Universiti Sains Malaysia (JEPeM Code: USM/JEPeM/KK/26010027). Approval from the HPUSM Nephrology Unit was also obtained before data collection (Appendix C; Appendix E).

3.10.1 Subject vulnerability

All participants were informed about the study objectives, procedures, risks, and benefits before participation. Participation in the study was voluntary, and written informed consent was obtained before participation. Participants were informed that they were free to withdraw from the study at any time without any effect on their medical treatment.

This study involved minimal risk as it only required participants to respond to a standardized validated questionnaire while undergoing hemodialysis. No invasive procedure or intervention was conducted. However, participants might have experienced discomfort or hesitation in disclosing personal details regarding their sociodemographic factors and T&CM usage.

3.10.2 Declaration of absence of conflict of interest

The study was conducted purely for academic and research purposes, without any financial or personal gain. The findings were not influenced by any external parties, including healthcare providers or commercial entities related to T&CM products.

3.10.3 Privacy and confidentiality

Confidentiality and anonymity of the subjects were maintained. No names, medical record numbers, or any other personal identifiers were collected; instead, coded numbers

were allotted. Data were stored securely and were accessible only to the researcher and supervisor.

3.10.4 Community sensitivities and benefits

Participants were not judged or discouraged based on their responses regarding T&CM use. The findings of this study contributed to a better understanding of T&CM usage among hemodialysis patients and its association with sociodemographic factors. This knowledge aimed to help healthcare professionals improve patient communication, awareness, and culturally sensitive care, ultimately benefiting the hemodialysis patient community.

3.10.5 Honorarium and Incentives

To acknowledge the time and effort of the respondents, all participants received a token of appreciation. Additionally, an educational poster was provided to each respondent to enhance their understanding of the study topic (Appendix F). These measures aimed to recognize their contribution and encourage engagement throughout the research process.