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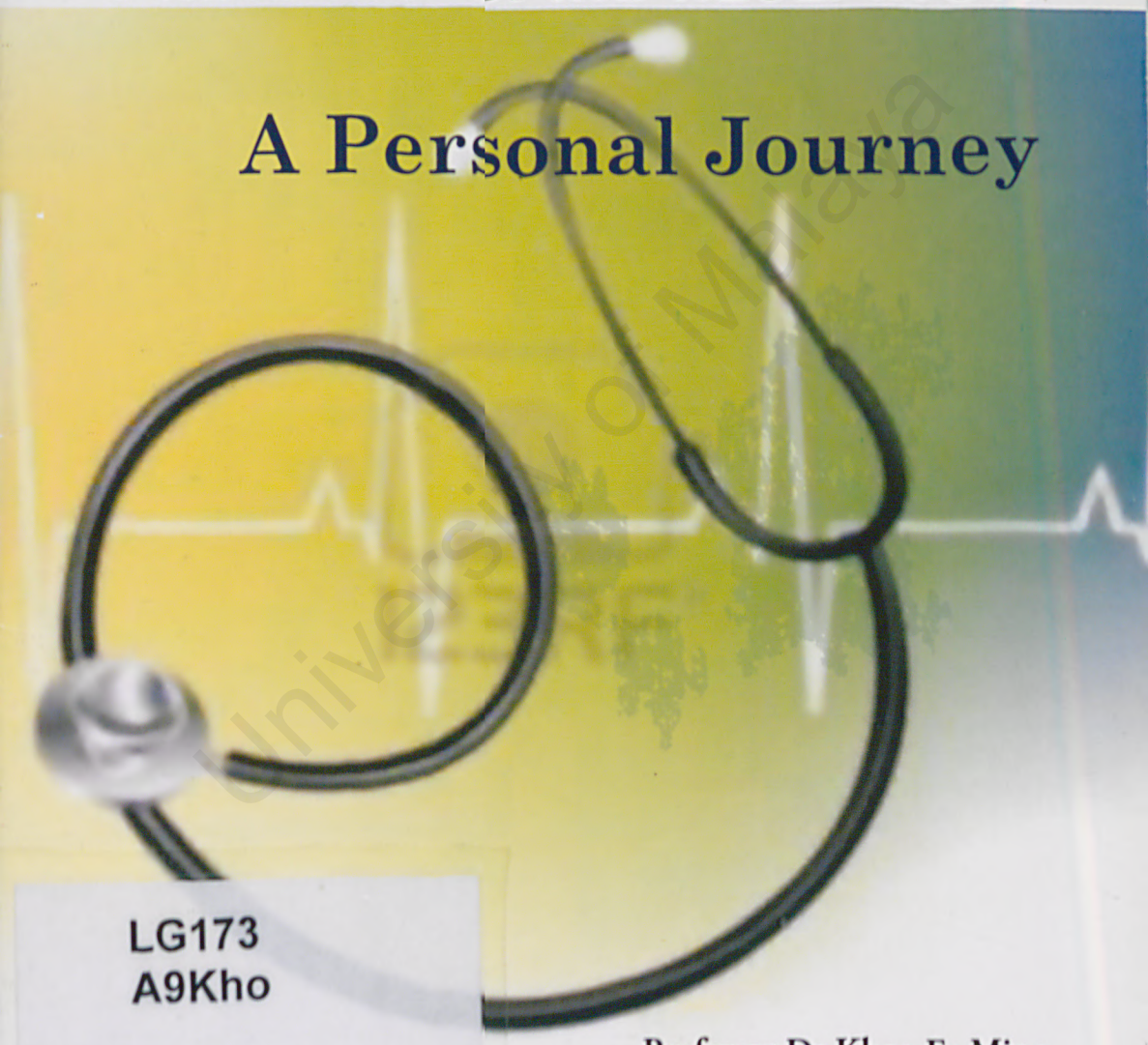
INAUGURAL LECTURE

PRIMARY CARE RESEARCH

A Personal Journey



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Primary Care Research – A Personal Journey

Inaugural Lecture

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Professor Dr Khoo graduated from St.George's Hospital Medical School in London, UK, in 1986. She subsequently received her vocational training in general practice and obtained her professional postgraduate degree MRCGP from the Royal College of General Practitioners, UK, in 1991. She practised as a general practititioner at a group practice in Huddersfield, UK until 1993 when she returned to Malaysia and joined the Department of Primary Care Medicine at the University of Malaya until now. In 2002 She was awarded the World Health Organisation Fellowship to look at the development of health systems based on primary care at the University of Sydney, Australia. In 2006 she was awarded Fellow of the Academy fo Medicine of Malaysia and in the same year Fellow of the Academy of Family Physicians of Malaysia. Professor Khoo was appointed the Head of the Department of Primary Care Medicine, University of Malaya in 2006 to 2009. In 2007, she joined the National Specialist Register when this was first introduced by the Ministry of Health. Amidst her work as the head of department during this period, she pursued her research work on somatisation disorder in primary care and was awarded the Doctor of Medicine degree from the University of Malaya in 2010.

Professor Khoo has been actively involved in the development of postgraduate Master of Family Medicine programme at the university and national level. She is the overall coordinator for the Master of Family Medicine programme at the University of Malaya for more than 10 years. She is also a committee member of the National Conjoint Board for the Master of Family Medicine programme. She has been the coordinator, examiner, board member of examiners for the conjoint examinations of the Master of Family Medicine programme in Malaysia. Throughout these years, she has succesfully supervised 19 candidates of the Master of Family Medicine programme to completion and 11 master candidates still ongoing. Apart from postgraduate programme, she is also a committee member of the undergraduate medical curriculum and examiner of the MBBS examination for the Faculty of Medicine, University of Malaya. She was the Department

Quality Manager in 2000-2003. In recognition of her service and contribution to the University, she was awarded the University of Malaya Excellence Service Award in the years 2000, 2005 and 2006.

Professor Khoo's professional standing has also seen her being appointed as the external examiner for MB BS clinical examinations at the International Medical University for a number of years from 2001 to 2007; external examiner for Master of Rehabilitation Medicine Clinical Examination, University of Malaya from 2002-05; external examiners for the Master of Family Medicine programme at the National University of Singapore in 2009, Fellowship Examination in Family Medicine, College of Family Physician, Singapore, in 2010 and 2011. She was also appointed as an external assessor for the post of Associate Professor and Professor in Family Medicine in national universities. In addition, she was appointed to evaluate candidates for entry and progress of Doctor Of Philosophy (PhD) and Doctor Of Medicine (MD), and research proposals for grants approval for the Faculty of Medicine.

Professor Khoo has published many papers in peer reviewed journals, books, and book chapters. She has presented at many scientific conferences and has organised many conferences, workshop, seminars on primary care research and clinical medicine. Her particular areas of research interest include chronic diseases, men's health, women's health, and mental health. She is actively involved in primary care research, health system research and clinical trials. She has established research linkages with many institutions such as the Univesrity of Sheffield in the UK for CICHE project on psychological illness and somatisation; University of Warwick, UK, for 'Easycare' an instrument for elderly care; Institute of Health System Research for patient safety in primary care, and evaluation of public and private services in primary care delivery; Clinical Research Centre in Malaysia for morbidity pattern in children and the elderly; Evipnet (Evidence Informed Policy Network) for policy brief; Ministry of Health Family Health development division for effectiveness of Family Medicine Specialists study; University Science Malaysia for cervical cancer; Malaysian Society of Andrology and the Study of the Aging Male for men's health. She is an active committee member of the Malaysian Primary Care Research Group since its inception in 2004 and was the chairperson of this group in 2006. Recognising her expertise in the discipline, she was invited as committee members and member of the guideline developing group for many clinical practice guidelines aimed primarily at primary care physicians. These include clinical practice guidelines on hypertension, diabetes mellitus, dengue and dengue haemorrhagic fever, growth hormones, chronic obstructive pulmonary disease, neuropathic pain, and screening. Indeed, she conducts research involving multidisciplinary teams

and she bridges the gap between universities, academies and Minitry of Health through research.

Apart from research and publications, she is an editorial board member of the Asia Pacific Journal of Public Health and the Malaysian Family Physician journal. She was also the past editor in chief of the journal 'Family Physician' in Malaysia. She has been a reviewer to many scientific journals, books, guidelines, policy brief, as well as international scientific conferences. She was also invited as a judge for scientific presentations.

Professor Khoo is also an active figure in the Academy of Family Physician (AFPM) Malaysia to promote the discipline. She was the chief co-ordinator for the Part II Clinical Examination of the Conjoint Malaysian Academy of Family Physician/Fellowship Examination of the Royal Australian College of General Practitioners (MAFP FRACGP) in 1997 to 2002; committee member of the Chapter of Medical Teachers in 2002; council member since 2003; the academic committee member in 2005; Academic co-chairperson and EXCO member in 2006; Member of expert panel of Quality improvement programme for general practitioners since 2006; member of the Board of Diploma in Family Medicine programme (DFM) and Advance Training Programme since 2010.

Besides her involvement in the AFPM, Professor Khoo is also an active member of many professional associations and societies. She is a panelist for The Star Health & Ageing Advisory Panel on the "Age Well" column under the section on "Fit for Life", which features different topics on health issues every fornightly on Sundays in the STAR newspapers to promote health related matters to the public. She has delivered talks, forum and conducted workshops to the public. She also helps in the establishment of clinical hypnosis in Malaysia to promote health and as a recognition of her contribution, she was awarded the Honorary Fellow of the British Society of Clinical Hypnosis since 2009.

Primary Care Research – A Personal Journey

In the world of academia, research and publication are core functions. Without these, academicians will perish. However, are research and publication important for university ranking alone or is it realizing the truth or near truth of our research findings? Are they providing us the evidence for our clinical practice? Should primary care research be broad based as our discipline or should primary care physicians concentrate on one area of interest as in other specialties? Does in-depth knowledge in a specific area applies to primary care researchers or should we be 'general' in our research interests? These decisions in our academic career are sometimes as uncertain as we undertake any major decision in life. We are straddling a path between academic inquisitives and clinical enhancement.

Primary care is the richest ground to generate questions for research that will provide us evidence for clinical practice. The enthusiasm in clinical practice is often the impetus for us to carry out such research. History tells us that research in primary care stemmed from physicians' interests in their patients. The identification of smallpox by Jenner that led to its eradication in the 18th century; the observed transmission of yellow fever by mosquitoes by Finlay in the 19th century; the identification of the mode of transmission of infectious hepatitis by William Pickles in the 20th century has informed us that clinical questions generated through patient care led to better understanding of diseases and in turns promote better health care.

However, although the majority of patients are seen in primary care, minority of research is done in this setting. The reasons include lack of research training within primary care, time constraint, lack of space in practice, few academic centres for primary care in the country and funding issues.

Therefore, the challenge of developing research in primary care is to enhance research capacity, create strong infrastructure to engage primary care clinicians in the research arena. This include strengthening academic departments, enhancing links to researchers in other fields, improving training programs for future primary care researchers, developing more practice-based primary care research networks, and increasing funding for research in primary care. Research in primary care is essential to inform clinical practice and to develop better health systems and health policies.[1] We need to be an integral part of the research world so that the right

questions are being asked, the research findings are applied in practice, and evidence-based approach to primary care practice is the norm.

Practice management

My personal journey in research starts when I entered academia at the University of Malaya after being a practising general practitioner (GP) in the UK. My first research endeavour was to examine GP practices teaching our undergraduate students. This research question was mooted as my co-researcher and I were practicing GPs in other countries, and we were fairly ignorant of the local practice. A postal survey was conducted in 1994 and 35 of the family practice tutor practices responded, giving a response rate of 88%. [2] Of these teaching practices, only 54% of GP tutors had a postgraduate qualification, and 58% of these were GP professional degree. Half of these practices were solo practices, 60% had computers in practices used for the purpose of word processing. Most tutors had personal patient load of 20/day, and less than half of the patients were seen by appointments. Only one third of the practices had employed qualified nurses. Most practices were well equipped and provided a comprehensive range of services.

With these findings in mind, the question then raised was "What were the profiles of general practices in Malaysia?" In 1995-1996, 1171 general practices were surveyed.[3] Out of these practices, only 6% GPs possessed a postgraduate qualification in primary care medicine, 4% did research in the last 3 years. A total of 75% ran solo practices, 90% of the practices opened six or seven days a week. The mean workload per doctor per day was 44.7. Most practices provided comprehensive range of services and 43% had a computer. Therefore, postgraduate training was in its infancy then in Malaysia. Subsequently, these 1171 urban general practices in the East and West Malaysia were compared for their service profiles and practice facilities as it was observed that the geography, culture, and accessibility to care and patient demands vary in different parts of Malaysia.[4] We found more practices in East Malaysia were providing sexually transmitted diseases services but less were providing counselling services including sexual and marital counselling. Most practices in East Malaysia were solo practices, but they had more pracrice facilities such as ultrasound, computers and ECG machines compared with those in the West. The higher computerisation rate and ownership of practice equipment in East Malaysia could be attributed to difficulty in accessibility, both in resources and care.

In 2002, I visited Australia as a Fellow of the World Health Organisation to examine the structure of primary health care system. Through visits and observation of the general practice structure in these two countries, it appeared the primary care structure was not dissimilar in both countries in service provision but the fee payment structure was different. Both countries

seemed to have moved towards preventive health care and chronic disease management. Rural and aboriginal health issues remain important in both countries.[5] In terms of standard of practice, the quality of general practice delivery has been extremely variable In Malaysia. A medical practitioner can set up practice as a general practitioner with only a basic medical degree. In Australia, compulsory vocational training for all GPs started in the 1990s. At the beginning of this transition period, GPs with five years of experience were considered vocationally registered through the 'grandfather' route. Now with the health care reform and 1 care, the standard of GP is certainly a challenging issue to address. Indeed this issue of setting a minimum requirement for entry into general practice is long overdue for the discipline for better standard of health care provision in the country.

Mental health

From practice management, the field of mental health was explored in 2003. We see patients attending our clinics for many reasons and it has been shown that of those who seek help for their symptoms, 25-50% of these symptoms could not be explained by physical diseases.[6-8] Studies have shown that somatisation is very common in all ethno-cultural groups among primary care clinic attenders.[9] However the prevalence of somatisation disorder varied in different cultural groups.[10] It has been observed that primary care physicians are reluctant to diagnose somatisation disorder partly because of the uncertainties and confusion about the complicated criteria for diagnosing somatisation disorder as those defined in the DSM-IV and ICD-10.

We conducted a pilot study on prevalence of somatisation in primary care attenders from 6 ethnic groups in the UK and Malaysia. We experienced considerable difficulty with regard to the cultural and operational definitions of somatisation for this study.[11] In both the UK and Malaysia, the presentation of physical symptoms could be used by patients from different cultures as an admission ticket to a consultant for validation of the sick role or as a reluctance to admit to mental health problems. This then led to my doctorate study on how common is somatisation disorders in primary care attenders in this part of the world.

Somatisation disorder is characterised as a chronic syndrome of medically unexplained physical symptoms in the absence of other major psychiatric diagnosis. It has been defined in a number of different ways such as the ICD-10, DSM-IV, abridged somatisation disorder, and multisomatoform disorder. Estimates of its prevalence vary considerably according to the healthcare setting, the operational criteria used, and the ethnic groups surveyed. Its prevalence has ranged between 0.03-35%.[12-18]

Somatisation disorder has been shown to be associated with generalized anxiety disorder and depression, occupational and social disability, significant psychopathology and functional disability, impair health related quality of life. However, its association with gender, older age, lower education level, socioeconomic status has been inconsistent. It often leads to extensive investigations, excessive healthcare utilisation, referral to secondary and tertiary care, and increased medical costs. Despite this, there have been no studies done in primary care about somatisation and somatisation disorder in Malaysia even though we have the richness of different ethnic groups living within the same health and welfare system.

A cross sectional study was carried in three health centres among primary care clinic attenders aged 18 years and above.[19] A stringent criteria for diagnosis of somatisation disorder was used that included 14-symptom list based on ICD-10 criteria for somatisation disorder for research, frequent attendance of more than 3 visits to a health care provider including complementary practitioner in the last 3 months and excluding moderate or severe anxiety and/or depression. Out of 2762 patients approached, 1763 participated, giving a response rate of 63.8%. Mean age was 44.7 $\pm$ 15.8 years. The prevalence of somatisation disorder was 3.7%, which was consistent with studies that used stringent criteria for somatisation disorder such as ICD-10 and DSM -IV. The prevalence was highest in the Malay (5.8%), followed by the Indian (3.0%) and the Chinese (2.1%). Using ICD-10 symptom counts alone gives a prevalence of 8.8% while the doctors' diagnosis of somatisation disorder was 2.7% and possible somatisation disorder was 8.8%.[20] The doctor's positive predictive value of SD against the operational criteria was only 5.4% but the negative predictive value was 96.7%. This suggests that doctors are uncertain about making a diagnosis of somatisation disorder.

A qualitative study was done later that further showed that this uncertainty in making the diagnosis was due to the complicated criteria of DSM-IV and ICD-10 of somatisation disorder that was not pragmatic for use.

The prevalence of somatisation disorder was predicted by Malay ethnicity, blue-collar workers and impaired physical health in the quality of life.[19] It was uncertain why Malay was found to have a higher prevalence of somatisation disorder, whether this reflected a true difference in prevalence, difference in instrument translation, cultural factors that influence meaning attached to symptoms & presentation, differences in the idioms of distress & psycholinguistic expression of emotional states or the familiarity with pathways to health care. In Malay, it is possible that the 'accepting' nature in the belief system, perception of illness & health as 'fate', may suppress their affect & translate to somatic complaints.

Blue-collar workers generally have more physically demanding jobs. It is possible that nature of an occupation has an influence on somatising behaviour. In Malaysia, medical certificate allows paid time off work and somatisation allows people to legitimatise their sick role in a society. The knowledge of this findings allow primary care physician to better identify patient with somatisation disorder in primary care.

It is important through these findings to redefine definition of SD for use in primary care & to reach a consensus on the classification & definition of SD as current definitions & criteria were not pragmatic. A review of SD definition for use in primary care is urgently needed as the lack of a standard definition could cloud its diagnosis. The latest versions of the DSM-V and the ICD-11 have indeed undergone revisions and discussion was to abolish or retain the category of somatoform disorder as doubt over its clinical value and conceptual basis. There were also talks about abolishing terminologies such as 'somatisation' and 'medically unexplained' as these terms presuppose a mind-body dualism. In summary, the revised criteria or new diagnostic definition should be clear, relevant and practical so that they could be implemented in the busy primary care clinic, where most patients with SD attended.

Apart from the definition of SD for primary care use, we recognise that different cultures have different beliefs about health, illness, use of medical services and treatments, and all symptom presentations are culturally mediated. For example, certain illnesses may be stigmatized within different cultures and patients, therefore, may present with symptoms acceptable within their own cultures rather than those which may conform to a Western model of disease.[21-22]

We found that 66.1% of the primary care attenders had one or more medically unexplained symptoms, which concurred with the hypothesis that somatisation is common in primary care. The commonest presenting medically unexplained symptoms among patients with somatisation disorder was bloatedness, numbness or tingling sensation, pain in the limbs extremities or joints, abdominal pain.[20]

As doctors, the knowledge of patients' cultural and religious beliefs and practices would facilitate effective communication; allow accurate diagnoses and shared decision on management be made. We need to be skilled at eliciting and understanding the cultural values of our patients and learn how to work with our patients' cultural values. This is particularly important when we are dealing with patients with somatisation who have psychological components to their physical illness to use our cultural knowledge effectively in transcultural consultations.[23]

Women's health

From mental health, we sought to answer some of the queries we have on women's health. Cervical cancer is the 3rd most common female cancer in Malaysia.[24] Cervical cancer screening programme was established in 1969 to ensure early detection of cervical cancer among women aged 20–65 years, yet pap smear coverage in the country is poor, i.e. 26% in 1996, as reported in the National Health and Morbidity Survey II.[25] Therefore, we conducted a qualitative study in 2005 to explore the knowledge, attitudes and beliefs on cervical cancer screening of Malaysian women. Our study has shown that many women did not have a clear understanding of the need for the early detection of cervical cancer and the meaning of an abnormal cervical smear. Many believed the Pap smear was a diagnostic test for cervical cancer and since they had no symptoms, they did not go for Pap smear screening test. Other main reasons for not doing the screening included a lack of awareness of Pap smear indications and benefits, perceived low susceptibility to cervical cancer and embarrassment.[26-27] The women are not aware of human papillomavirus. These findings highlight the importance of disseminating accurate information about cervical cancer and the purpose of Pap smear screening when designing interventions.

Dysmenorrhea is one of the most common gynaecological complaints in adolescent girls seen in primary care. A cross-sectional study was conducted with 1092 girls from 15 public secondary schools in the Kuala Lumpur to determine the prevalence of dysmenorrhea, its impact, and the treatment-seeking behaviour of adolescent girls and menstrual related symptoms. Overall, 74.5% of the girls who had reached menarche had dysmenorrhoea; half of these girls reported that it affected their concentration in class and restricted their social activities; 21.5% reported that it caused them to miss school; and 12.0% that it caused poor school performance. Only 12.0% of the girls had consulted a physician for their complaints and 53.3% did nothing about their conditions. There were ethnic differences found in the prevalence, impact, and management of dysmenorrhoea and a culture-specific education regarding menstruation-related conditions in the school curriculum is needed.[28]

For antenatal mothers, routine rubella antibody screening is not done in community health clinics in Malaysia. However, congenital rubella syndrome has persisted with its associated health burden. Five hundred pregnant mothers in the Petaling district, Selangor were recruited in a study for rubella susceptibility and Rubella IgG tests were performed.[29] The prevalence of rubella susceptibility among pregnant mothers was 11.4%. A history of not having received rubella vaccination or having unknown rubella vaccination status was found to be a significant predictor for mothers to be rubella susceptible. Thus, asking a single question on rubella vaccination status is predictive of their serological status.

Men's health

Emphasis has been placed on women's health until about a couple of decades ago. Men has shorter life span than women, they are more unlikely to seek health care attention. Nevertheless, they are at high risk of cardiovascular diseases, accidents, cancer and sexual dysfunction. They are a neglected high risk group. It is our job as primary care physician to take an interest in their health, to investigate their health seeking behaviour and to think of strategy and treatment for their well being. We conducted a survey of 351 men over the age of 50 years and found prevalence of ED was 70.1% (mild ED 32.8%, mild to moderate ED 17.7%, moderate ED 5.1%, and severe ED 14.5%); 29% had moderate and severe LUTS; 11.1% had severe depression; 25.4% was estimated to have androgen deficiency symptoms; 30.2% self-reported hypertension, 21.4% self-reported diabetes mellitus; 10.8% self-reported coronary artery disease; 19.1% were smokers; and 34% consumed alcohol.[30] There were 78.6% of men that were overweight and obese; 19.1% had total testosterone <11.0 nmoL/L, 4% had PSA > 4 mg/L. ED was found to be significantly associated with LUTS and depression. Strategies for early disease prevention and detection are warranted when men presents with ED.

Apart from ED, we have shown in men aged 18–70 years attending a primary care clinic, the prevalence of premature ejaculation (PE) was 40.6% (PE: 20.3%, probable PE: 20.3% using PEDT questionnaire).[31] PE was associated with ED, circumcision, sexual intercourse ≤5 times in 4 weeks and Indian ethnicity. We need to explore this sensitive matter with patients who may otherwise not sought treatment.

Chronic diseases

From men's health, we embarked on research involving chronic diseases. Cardiovascular disease is a common killer in our country. With near 40% patient having hypertension in Malaysia, it is not surprising our bulk of workload lingers around hypertension and diabetes mellitus.

In a study on 517 patients with Type 2 diabetes at a health centre in 2003, we have shown that the management of diabetes and its associated cardiovascular risk factors was suboptimal. About half of the patients had HbA1c above 8% and 24% had microalbuminuria.[32] Out of 68% of patients who had hypertension, only 3% achieved target BP of <130/80 mmHg. For those who had not achieved the target goal, 39.5 % of them were not on any antihypertensive drugs. Metoprolol was the most commonly used antihypertensive drug (22.4 percent), followed by Nifedipine (16.2 percent) and Prazosin (13.5 percent). Only 18.3 percent of patients with type 2 diabetes mellitus and hypertension were prescribed with angiotensin converting enzyme (ACE) inhibitors.[33]

In 2008, 79 public health clinics and 33 private primary care clinics were surveyed from a random selection of 100 public health clinics and 114 general practice in Malaysia to compare the process of care and the choice of antihypertensive medications used in these clinics.[34] Out of a total of 4076 patient records, less than 80% of the records documented the recommended clinical and laboratory assessments. The most common group of medication prescribed in public clinics was beta blockers (BB; 56.2%), followed by calcium channel blockers (CCB; 45.2%), angiotensin converting enzyme inhibitors (ACE-I; 31.5%), and diuretics (DU; 31.5%) whereas in the private clinics it was BB (40.2%), followed by ARB (19.8%), DU (18.3%), CCB (17.0%), and ACE-I (13.0%).Overall, 21% of the prescription practices were less than optimal. The process of care and the use of antihypertensive medications were not satisfactory in both settings, which is not dissimilar to findings elsewhere. The under use of ACEI and other therapeutic management should lead us to reflect on strategy to improve management of hypertension in primary care. This health system research provides us evidence to address the deficiency in our existing system.

Similarly, for asthma, 73% of patients presented with acute asthma at the emergency department at a teaching hospital were found to have poorly controlled asthma. Only 46% used inhaled corticosteroids and 35% did not have regular follow up.[35] Half of these patients were unable to recognize features of worsening asthma and 60% did not know the difference between reliever and preventive medications. Only 9% of patients were using peak flow meters.[36]

These further showed us that management of patients with chronic diseases are a big challenge to primary care physicians. Strategies for intervention will be the next wave of research to improve care for chronic diseases.

Health system research

Health system research on patient safety conducted at the health centres has informed us that medication errors were as high as 41%, management errors 53%, decision making errors 14.5%, diagnostic error 3.6%, documentation errors 98%. The majority of these record reviews were seen by medical assistants. Intervention package was developed, which included flip charts, clinical audits and system change. The intervention has led to improvement in documentation errors and medication errors. Flip chart on diagnosis and management of common illness can provide a quick aid to medical assistants and doctors in patient management. It is now being disseminated and used in health centres to improve care. Here is an illustration of knowledge translation in health care.

Primary Care Research bibliography and network

One of the frustrating tasks in conducting research is the difficulty in finding local data and literature as there is no systematic record of research in the country. Many research works are published in abstracts, reports and non-indexed journals, and the search is often far from providing the relevant findings. This short-coming was the impetus for the collection of the "Bibliography of Primary Care Research in Malaysia"[37] where research output in Malaysian primary care settings from 1966 to 2003 was collated. This was a three-year effort through both electronic and manual search of journals (local and international, indexed and non-indexed), monographs, reports, dissertations, conference proceedings, abstracts, and books. There were 1222 papers retrieved, 907 original articles and 207 theses/dissertations, 71 reports, 33 conference proceedings and 4 abstracts. 'Infections' was covered in 18.0% of the papers while conditions that were common in primary care such as musculoskeletal problems, skin problems appeared to be inadequately studied. This shows us the gaps in research locally. The electronic version of this book is freely available on the internet for use of all researchers. http://www.mpcrg.org/

In tandem with the bibliography work to stimulate primary care research, we formed The Malaysian Primary Care Research Group (MPCRG) in September 2004. The aim is to promote high quality primary care research in Malaysia. To-date there are about 200 members and it is growing from strength to strength.

Evaluations and editing

Research provides an evidence base for best clinical practice. Translating the evidence to practice is an essential task. Though team work, not only within the discipline but across disciplines, we are able to realise this. My involvements in clinical practice guidelines development for hypertension, diabetes, chronic obstructive pulmonary disease, neuropathic pain, dengue fever, growth hormone, screening throughout the years have portrayed the importance of multi-specialties and multidisciplinary work. This has promoted the discipline as well as facilitated primary care physicians in providing evidence based clinical management and patient care.

While publishing is a duty for all researchers to share new findings, evaluation works such as reviews and editing is another aspect of work that raised our standards in research. Being involved in the editorial board of Malaysian Family Physician Journal and the Asia Pacific Journal of Public Health, reviewing and editing closes the loop of academic work.

Conclusions

In conclusion, I have shown that diversity in research interests is a possible path in our academic career given our broad based discipline. Primary care research is flourishing in Malaysia. We should treat patient with our heart and build knowledge capacity through research.

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No	Qualification
1986	MBBS, St. George's Hospital Medical School, University of London, UK
1990	Family Planning Certificate, Joint Committee on Contraception, UK
1991	Certificates of Prescribed Experience in Vocational Training for General Practice, Joint Committee on Postgraduate Training for General Practice, UK
1991	MRCGP, The Royal College Of General Practitioners, UK
2001	AM, Member, Academy Of Medicine, Malaysia
2006	FAMM, Fellow, Academy Of Medicine, Malaysia
2006	FAFP, Fellow, Academy Of Family Physicians Of Malaysia
2007	National specialist register
2009	Honorary Fellow, British Society of Clinical Hypnosis
2010	Doctor Of Medicine (M.D.)

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2.	Teng CL, Khoo EM, Ng CJ (Eds.). Family Medicine, Healthcare and Society: Essays by Dr MK Rajakumar. Kuala Lumpur: Academy of Family Physicians Malaysia; 2008.
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4.	Tan HM, Tong SF, Low WY, Ng CJ, Khoo EM, Zainuddin ZM, Lee VKM. The effect of long-acting testosterone treatment on the Aging Male Symptoms (AMS) Scale- A randomized double blind placebo-control trial. Proceedings of the 26th Annual Congress of the European Association of Urology, Eur Urol Suppl 2011; 10(2): 129.
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8.	Khoo EM. Publish or Perish: The future survival tool of an academician? Seminar, Universiti Kebangsaan Malaysia. 2010.
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1. Principal Investigator. The III Study - Implementing, Innovation, In-Practice. UMRG. 2011-2013.
2. Co-Investigator. Developing and pilot-testing an intervention for patients with Type 2 diabetes who are making decision about starting insulin therapy. UMRG. 2010-2013.
3. Principal Investigator. A Phase III, Randomized, Clinical Trial to Evaluate the Safety and Efficacy of the Addition of Sitagliptin in Patients With Type 2 Diabetes Mellitus Who Have Inadequate Glycemic Control on a Sulfonylurea in Combination With Metformin. Merck Sharp & Dohme. 2010-12.

Research Project : Completed

1. Principal Investigator. Clinical trial: CSPP100A2408. A 12-week, randomized, double blind, parallel group study to evaluate the prolonged efficacy and safety of alikiren 300mg compared to telmisartan 80mg in hypertensive patients with 24-hrs ambulatory blood pressure measurement after 1 week treatment withdrawal. Novartis. 2009.
2. Co-Investigator. Generation X and Y Men s Perceptions of Sexual Health and Overall Health. Janseen-Cilag. 2009.
3. Supervisor. Childhood asthma: assessment of control among primary care school children- a community based study. UM postgraduate fund. 2008-9.
4. Supervisor. Prevalence of microalbuminuria among hypertensice non diabetic patients in a primary care clinic. UM postgraduate fund. 2008-9.
5. Co-Investigator. A Qualitative Study on Men s Perception of Health and Illness, factors influencing their health behavior, and Women s role in men s health. Malaysian Society of Andrology and The Study of The Aging Male (MSASAM). 2008-9.
6. Co-Investigator. Nebido Trial.-Bayer HealthCare. 2008-10.
7. Supervisor. Prevalence of chronic kidney disease in patients with diabetes mellitus and its associated factors. UM postgraduate fund. 2008-9.
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9. Principal Investigator. INSPIRE ME IAA Study. International study of prediction of intra-abdominal adiposity and its relationships with cardiometabolic risk/intra- abdominal adiposity. Pharmaceutical Grant - Sanofi Aventis. 2008.
10. Co-Investigator. An annotated bibliography of Men s Health in Asia. Malaysian Society of Andrology and the Study of the Aging Male (MSASAM). 2008.
11. Principal Investigator. Real-Life Effectiveness and Care Patterns of Diabetes management in Asia-Pacific (The Asia-Pacific RECAP-DM Study). Pharmaceutical Grant - Merck, Sharp & Dohme. 2007.
12. Co-Investigator. Cross-cultural adaptation and validation of the Aging Males' Symptoms (AMS). Malaysian Society of Andrology and The Study of the Aging Male (MSASAM). 2007.
13. Principal Investigator. MK-0524A Protocol 069. A multicenter, randomised, double-blind, placebo-controlled, 36-week study to evaluate the efficacy and safety of extended release (ER) Niacin/ Laropiprant in patients with Type 2 Diabetes Mellitus. MSD. 2007-8.

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15. Co-Investigator. Cross-cultural adaptation and validation of Bahasa Melayu version of the Aging Males' Symptoms (AMS). Malaysian Society of Andrology and The Study of the Aging Male (MSASAM). 2006-7.
16. Co-Investigator. DFI6032 (RAVEL) study. Sanofi Aventis. 2006-8.
17. Co-Investigator. Usage of clincal practice guideline on diabetes mellitus. RM9 Ministry of Health. 2006-9.
18. Co-Investigator. Subang Jaya Men s Health Study Phase II (SAM). Ministry of Women and Family Development. 2006-2011.
19. Principal Investigator. Medical safety interdisciplinary study of medical errors in selected primary care facilities. RM9 Ministry of Health. 2006-2011.
20. Supervisor. Susceptibility of rubella in pregnancy. Vote F. 2005-9.
21. Co-Investigator. Subang Jaya Men s Health Study. Malaysian Society of Study of Aging Male. 2005-9.
22. Co-Investigator. ZANIDIP STUDY. A single centre, open label phase II study to assess efficacy and safety of lercanidipine in treating patients with essential hypertension. Orient Europharma (M) Sdn Bhd. 2004-9.
23. Supervisor. Peripheral arterial disease among diabetic patient in primary care practice. Vote F. 2004-9.
24. Co-Investigator. Does an interactive medical education workshop improve screening and management of diabetic patients with erectile dysfunction?
25. Asia Pacific Society for Sexual Medicine (APSSM). 2004-5.
26. Principal Investigator. DISCOVERY STUDY. An open label, randomised, multi-centre, phase IIIb/IV, parallel group study to compare the efficacy and safety of rosuvastatin and atorvastatin in subjects with type II1 and IIb hypercholesterolaemia. AstrazenecaSdn Bhd. 2004-5.
27. Co-Investigator. Multicentre Comparative; and Study of the knowledge, beliefs and socio-behavioural risk factors in women with precursor lesions and women with cancer of the cervix and their respective partners and women who have never had pap smear screening; IRPA/PIP 2004-2007.
28. Co-Investigator. ALISKIREN STUDY. An 8 week, randomised, double-blind, parallel group, multicenter, dose escalation study to evaluate the efficacy and safety of aliskiren administered alone and in combination with ramipril in patients with hypertension and diabetes mellitus. Novartis. 2004-5.
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31. Principal Investigator. Evaluation of primary care research in Malaysia. Fundamental research fund (PPF) 2003.
32. Co-Investigator. Antibiotics prescribing practices of upper respiratory tract infections in primary care. IRPA. 2003.
33. Co-Investigator. A study on the effectiveness of Family Medicine Specialist (FMS) Services. A ministry initiated project nationwide. Ministry of Health, Family health division. 2003.
34. Co-Investigator. Upper gastrointestinal endoscopy indications and outcome. Vote F. 2003.
35. Co-Investigator. Falls in elderly with chronic illnesses prevalence and associated risk factors. Vote F. 2002.
36. Principal Investigator. Somatization & Cultural Expectation. Vote F. 2002-3.
37. Co-Investigator. A pilot study to redefine dementia diagnostic procedures in the Malay community. China Medical Board. 2002-4.
38. Principal Investigator. Somatisation disorder in Malaysia. China medical board. 2002.
39. Co-Investigator. 10/66 Demeñtia study. A global multi-centred study under 10/66 Dementia Research Group, Institute of Psychiatry, University of London. China Medical Board. 2002.
40. Co-Investigator. Somatisation disorder prevalence and cultural expectation. Vote F. 2001.
41. Co-Investigator. Dyspepsia in primary care. 2001.
42. Co-Investigator. Sexual health problems: Attitudes and practices of Malaysian general practitioners. Malaysian Erectile Dysfunction Advisory Council and Training (MEDACT). 2001-2.
43. Co-Investigator. ASIA-CAP Study. A multi-centre Asian study on the role of atypical pathogens in community acquired pneumonia. Pfizer. 2001.
44. Co-Investigator. Evaluation of the current practice of ordering for exercise stress testing among primary care doctors in UMMC. Vote F. 2001.
45. Co-Investigator. Knowledge and prevalence of irritable bowel syndrome. 2001.
46. Principal Investigator. Cervical smear screening pattern in Kota Kinabalu health centres. Vote F. 2000.
47. Co-Investigator. A survey of attitudes and practices of doctors towards sexual problems in patients. Pfizer Educational grant. 2000.
48. Co-Investigator. FORTZAAR SWITCH Study. MSD. 2000.
49. Co-Investigator. ISH Study. A multicentre randomised, triple-blind study of the efficacy and safety of Losartan/HCT vs Amlodipine/HCT in patients with isolated systolic hypertension. MSD. 2000.
50. Co-Investigator. P.A.L.M.Study. Servier. 2000.

51. Principal Investigator. Psychological illness in primary care and somatisation. CICHE Project.
52. Co-Investigator. Language proficiency and the ability to learn communication skills. Vote F. 1999.
53. Principal Investigator. Structural and practice management characteristic of general practices in Malaysia. China Medical Board. 1997
54. Co-Investigator. Attitudes and practices of health care workers concerning breastfeeding and its management. Vote F. 1996.
55. Principal Investigator. Community based primary health care in Malaysia. IRPA1995.
56. Principal Investigator. Characteristics of primary care practices in undergraduate family practice tutors. Vote F. 1994.

Post Graduate Supervision

Master of Family Medicine, University of Malaya - Completed. 19. candidatesMaster of Family Medicine, University of Malaya - Ongoing. 11. candidatesMaster of Medical Science, University of Malaya - 1 candidate.

Professional Affiliation/Membership

1. Board Member. Academy Of Family Physician, Advance Training Programme since 2010.
2. Board Member. Academy Of Family Physician, Diploma of Family Medicine Programme, Academy of Family Physicians of Malaysia since 2010.
3. Editorial Board Member. Malaysian Family Physician Journal.
4. Practice visitor. Quality improvement programme for general practice clinics (QIP). 2009-2010.
5. Member. Evipnet (Evidence Informed Policy Network) Malaysia. 2009-2010.
6. Subeditor committee. DFM module, Academy of Family Physicians of Malaysia. 2009.
7. Fellow. British Society of Clinical Hypnosis. 2009.
8. Practice reviewer. Academy of Family Physicians of Malaysia. 2007.
9. Fellow. Academy of Medicine Malaysia. 2006.
10. Fellow. Academy Of Family Physician Malaysia. 2006.
11. EXCO member. Academy of Family Physicians of Malaysia. 2006.
12. Academic co-chair. Academy Of Family Physicians Of Malaysia. 2006.
13. Chairperson. Malaysian Primary Care Research Group. 2006.
14. Expert panel. Quality Improvement Programme, Academy of Family Physician Malaysia. 2006.

15. Panellist. The Star Health & Ageing Advisory Panel. (National Daily). Since 2005.
16. Academic committee member. Academy of Family Physicians of Malaysia. 2005.
17. Member. International Federation Of Primary Care Research Networks. Since 2005.
18. Member. International Society For Sexual Medicine. Since 2005.
19. Member. Asia Pacific Society for Sexual Medicine. Since 2004.
20. Member. Qualitative Research Association of Malaysia. 2004.
21. Member. Malaysia Society of Andrology and The study of Aging Male. Since 2004.
22. Member. International Society for Sexual and Impotence Research. 2004.
23. Committee member. Malaysian Primary Care Research Group. Since 2004.
24. Council member. Academy of Family Physician Malaysia. 2003/2005, 2007-8, 2009 to date.
25. Member. Malaysian Hypertension Society. Since 2003.
26. Committee member. Chapter of Medical Teachers, Academy of Family Physician Malaysia. 2003.
27. Fellow. World Health Organisation. 2002.
28. Member. Academy of Medicine, Malaysia. Since 2001.
29. Adviser. Vocational Training in Family Practice Malaysia, Academy of Family Physician Malaysia. 1998.
30. Member. Academy of Family Physician Malaysia. Since 1995.
31. Member. Royal College Of General Practitioner United Kingdom. 1993.

Awards

1. Best poster award. Asia Pacific Primary Care Research Conference, Melaka, Malaysia. 2009.
2. Merit award for outstanding free paper presentation. 18th WONCA World Conference, Singapore. 2007.
3. Excellent service awards. University of Malaya. 2000, 2005, 2006.
4. Andromeda award for best clinical free paper presentation. AGASSI (Aging, Gender, Andrology, & Sexual Society of India) conference, India. 2006.
5. 1st prize poster award. Asean Japan men's health conference. 2006.
6. 2nd prize poster award. Malaysian Society of Hypertension. 2006.