



**UNIVERSITI PUTRA MALAYSIA**

**APPLICATION OF A SOCIAL COGNITIVE THEORY  
MODEL TO ANALYSE HYPOGLYCAEMIC RISK  
FACTORS IN OLDER PATIENTS WITH TYPE 2  
DIABETES IN TWO RURAL PRIMARY HEALTHCARE  
CLINICS IN SELANGOR, MALAYSIA**

**OOI CHEOW PENG**

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**DOCTOR OF PHILOSOPHY  
UNIVERSITI PUTRA MALAYSIA**

**2010**

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment  
of the requirement for the degree of Doctor of Philosophy

**APPLICATION OF A SOCIAL COGNITIVE THEORY MODEL TO  
ANALYSE HYPOGLYCAEMIC RISK FACTORS IN OLDER PATIENTS  
WITH TYPE 2 DIABETES IN TWO RURAL PRIMARY HEALTHCARE  
CLINICS IN SELANGOR, MALAYSIA**

By

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2010

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**Institute: Institute of Gerontology**

The confluence of the ageing population and rise in prevalence of Type 2 Diabetes Mellitus (T2DM) among the younger adults will lead to an epidemic in the older adults. These older adults with T2DM are vulnerable to hypoglycaemia, and they suffer significantly from its adverse consequences.

The main objective of this study is to determine the specific putative modifiable factors that can significantly contribute to the hypoglycaemic risk amongst older people with T2DM, within two rural primary care clinics in Selangor, Malaysia. Social Cognitive Theory (SCT) is used to guide the translation of the modifiable risk factors of hypoglycaemia into the perspective useful for clinical practice. The hypotheses of the significant relationship between the putative risk factors as well as the determination of putative modifiable risk factors on the proportion of hypoglycaemia in the sample of older patients with T2DM were tested.

A cross-sectional study was carried out amongst 170 young-old adults with T2DM. Consecutive patients who fulfilled both the inclusion and exclusion criteria were invited. Informed consent was sought prior to interview. Structured questionnaires consisting of a checklist of 20 self-reported symptoms of hypoglycaemia, awareness, fear and prevention of hypoglycaemia were used. Information from medical records was also used to compile the information required for the 'Mini-Nutritional Assessment – short-form' and for quantifying the level of social engagement. Binary logistic regression analyses were used to analyse the data.

The results revealed that these respondents had high social engagement, suboptimal glycaemic control, high proportion of mild hypoglycaemia, cardiovascular risk and risk factors for disability. Four modifiable risk factors significantly contributed to the hypoglycaemia in the respondents, namely; microvascular complications of T2DM, awareness of hypoglycaemia, nutritional risk and a lower level of social engagement. The significant association of the fear of hypoglycaemia with hypoglycaemia, and the suppression of the level of social engagement in the hierarchical logistic regression model, implies all constructs of the SCT (personal, social and psychological domains) are required to explain the inter-relationships of the risk factors in hypoglycaemia. This has not been shown in previous studies.

The respondents are at risk for disability but not disabled. Thus, there are windows of opportunity to target potential interventions that extend beyond glycaemia control, to the maintenance of functional status, participation in social life and the

prevention of disabilities. These potential interventions include developing education and management programs, emphasising hypoglycaemia in the care of older diabetics. Extending the understanding of mechanisms of the inter-relationships of biological, medical, psychological and social domains, including the contributions of social support, is also important. Externally validating these risk factors of hypoglycaemia on a different set of older adults with T2DM will facilitate the development of a clinical support tool.



Abstrak tesis yang dikemukakan kepada senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah.

**PENGGUNAAN SATU MODEL TEORI KOGNITIF SOSIAL UNTUK  
MENGANALISIS FAKTOR RISIKO HYPOGLYCAEMIC DALAM  
PESAKIT WARGA TUA DIABETES MELLITUS JENIS 2 DI DUA  
KLINIK KESIHATAN PRIMER LUAR BANDAR DI SELANGOR,  
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Pertembungan diantara pertumbuhan pesat bilangan penduduk tua dan peningkatan prevalens penyakit Diabetes Mellitus (DM) Jenis 2 dalam kalangan orang dewasa akan menyebabkan epidemik penyakit ini dalam kalangan warga tua. Warga tua pesakit DM Jenis 2 mudah terdedah kepada hipoglisemia serta kesan buruk akibat hipoglisemia.

Objektif utama kajian ini ialah untuk menentukan faktor boleh diubah khusus yang menyumbang kepada risiko hipoglisemia dalam kalangan warga tua pesakit DM Jenis 2 dari dua klinik rawatan primer luar bandar di Selangor, Malaysia. Teori kognitif sosial (SCT) digunakan sebagai panduan untuk menterjemahkan faktor risiko bolehubah hipoglisemia kepada perspektif berguna untuk amalan klinikal.

Hipotesis hubungan signifikan antara faktor risiko bolehubah serta penentuan faktor risiko bolehubah hipoglisemia ke atas kadar hipoglisemia dalam sampel kalangan warga tua pesakit DM Jenis 2 diuji.

Satu kajian tinjauan keratan lintang telah dijalankan dalam kalangan 170 pesakit DM Jenis 2 dewasa tua-muda. Pesakit konsekutif yang memenuhi kedua-dua kriteria '*inclusion*' dan '*exclusion*' dijemput untuk menyertai kajian. Persetujuan untuk menjadi responden dipohon sebelum temubual. Soalan berstruktur mengandungi senarai semak lapor sendiri 20 simptom hipoglisemia, kesedaran, takut dan pencegahan hipoglisemia digunakan. Maklumat rekod perubatan juga diperolehi untuk mengukur pemakanan (Mini-Nutritional Assessment – short-form) dan untuk mengukur tahap penglibatan sosial. Regresi logistik binari digunakan untuk menganalisis data.

Hasil kajian ini menunjukkan responden mempunyai tahap penglibatan sosial tinggi, pengawalan glukosa dalam darah suboptimal, tinggi kadar hipoglisemia sederhana, tinggi risiko mendapat penyakit kardiovaskular dan ketidakupayaan. Empat faktor risiko bolehubah didapati menyumbang kepada hipoglisemia responden, iaitu komplikasi mikrovaskular DM Jenis 2, kesedaran hipoglisemia, risiko pemakanan dan penglibatan sosial yang rendah. Hubungan signifikan perasaan takut terhadap hipoglisemia dengan hipoglisemia, penumpasan tahap penglibatan sosial dalam model regresi logistik hierarki menunjukkan semua konsep dalam SCT (domain

peribadi, sosial dan psikologi) diperlukan untuk menerangkan hubungkait faktor risiko hipoglisemia. Ini tidak pernah ditunjukkan dalam kajian lepas.

Respondens kajian ini berisiko ketidakupayaan tetapi belum tidakupaya. Maka terdapat peluang untuk target potensi intervensi yang melebihi kawalan glisemia, kepada pengekalan kefungsian, penglibatan dalam kehidupan dan pencegahan ketidakupayaan. Intervensi berpotensi termasuk program pembangunan pendidikan pengurusan yang mengutamakan penjagaan hipoglisemia dalam kalangan pesakit DM Jenis 2. Memperluaskan pemahaman mekanisme hubungkait domain biologi, perubatan, psikologi dan sosial termasuk sokongan sosial adalah juga penting untuk diberikan perhatian. Secara luaran, pengesanan faktor risiko hipoglisemia ke atas faktor risiko hipoglisemia ke atas lebih ramai wargatua berpenyakit DM Jenis 2 akan memudahkan pembangunan alat sokongan klinikal.



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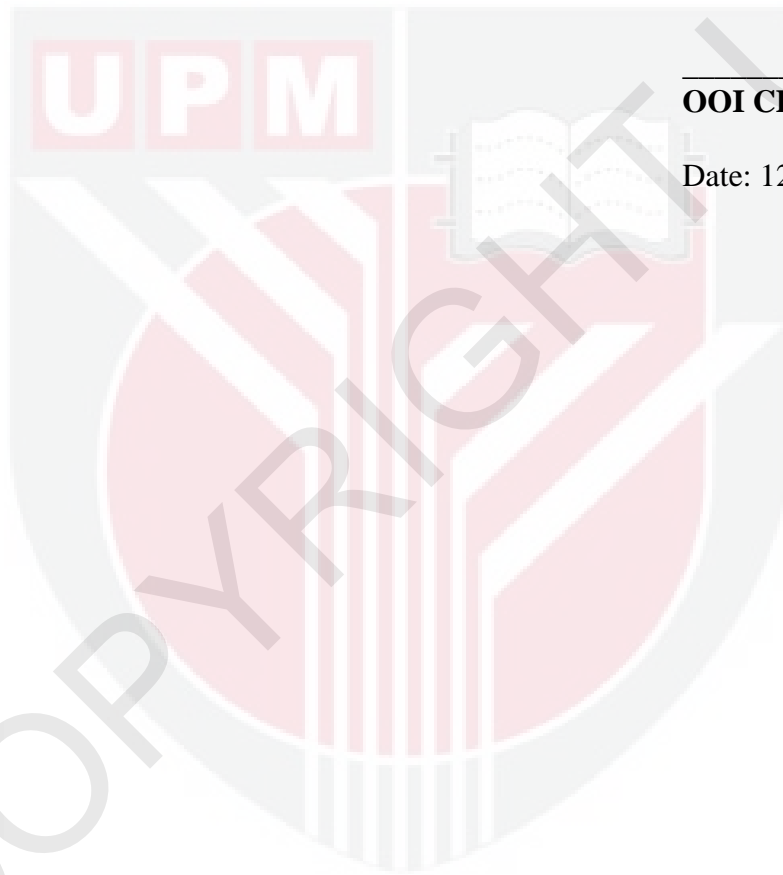
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## DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously and is not concurrently submitted for any other degree at Universiti Putra Malaysia or at any other institution.

**OOI CHEOW PENG**

Date: 12<sup>th</sup> January 2011



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