



**UNIVERSITI PUTRA MALAYSIA**

**EFFECTS OF AN EMAIL-LINKED WEBSITE INTERVENTION ON  
CANCER-RELATED NUTRITION AND LIFESTYLE RISK FACTORS  
AMONG EMPLOYEES OF A PUBLIC UNIVERSITY**

**ANG YEE KWANG**

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By

**ANG YEE KWANG**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in  
Fulfilment of the Requirement for the Degree of Master of Science**

**June 2011**

## **Dedication**

This work is dedicated to my Dad for his past unwavering love, care and support.

Born on February 11, 1954

Passed to Heaven on July 5, 2006



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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**June 2011**

**Chairman : Associate Professor Mirnalini Kandiah, PhD**

**Faculty : Medicine and Health Sciences**

Epidemiological studies have consistently yielded evidence that healthful nutrition and lifestyle are independently important in the prevention of cancer. Evidence was further established by the World Cancer Research Fund and American Institute for Cancer Research (2007). The internet technology via e-mail and website has been identified as an important channel for health communication and promotion. The objective of this study was to determine the effect of 10-week email-linked website intervention on cancer-related nutrition and lifestyle risk factors among employees of a public university. Ten faculties were randomized to an intervention or control group. The intervention group received weekly emails with hypertext links to a website, *http://www.nutrihealth-upm.com*, for downloading educational modules for 10 consecutive weeks and individualized phone calls whilst the control group received no weekly emails. Ten educational modules were developed in accordance with the international guidelines for

cancer prevention in the Malay language. Employees who were systematically sampled in the selected faculties were recruited with informed consent (n=339). Baseline and post-intervention cancer related nutrition and lifestyle assessments were conducted by using a reliable self-administered questionnaire. Study groups (Intervention, I=134; Control, C=126) completed all assessment at baseline, immediately after intervention (T1), and at 3 months post-intervention (T2). There were no significant baseline differences between the intervention and control groups for any of the socio-demographic and economic, nutrition and lifestyle risk factors (high dietary fat, low fruit and vegetable intake, smoking, alcohol consumption and low physical activity), and psychosocial variables except for perceived benefits for reducing fat intake, and increasing fruit and vegetable intake. At T2, a significant small increase in serving size for fruit and vegetable, total physical activity and walking was observed in the intervention group. A significant improvement in dietary vegetable intake was similarly observed in the control group, but not for physical activity. No significant change on the anthropometric measurements (body weight, waist and hip circumferences, body mass index, and waist-hip ratio) was observed. In addition, the results showed a significant positive change ( $p<.05$ ) for the total knowledge and subscales (diet, physical activity, weight management, and lifestyle), perception on health status and cancer risk, and psychosocial factors (self-efficacy, perceived benefits and perceived barriers) for dietary fat, fruit and vegetable intake, and physical activity in the intervention group at T1 and T2. However, the change in knowledge and change in psychosocial factors did not significantly correlate with each other as well as with the change in nutrition and lifestyle risk factors. In conclusion, effectiveness of this email-linked website intervention in improving cancer-related

knowledge, perception and psychosocial factors may implicate employees to modify health behaviour risk factors although additional elements such as environment and social support are needed to bring about such a positive move. The use of the internet as a means to educate the general public about disease prevention should be maximized as it is a potential avenue for health communication and is increasingly accessible to the adult population.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**KESAN INTERVENSI EMEL DAN LAMAN WEB TERHADAP RISIKO  
KANSER YANG BERKAITAN DENGAN PEMAKANAN DAN GAYA  
HIDUP DI KALANGAN PEKERJA DI UNIVERSITI AWAM**

Oleh

**ANG YEE KWANG**

**Jun 2011**

**Pengerusi : Profesor Madya Mirnalini Kandiah, PhD**

**Fakulti : Perubatan dan Sains Kesihatan**

Kajian epidemiologi dengan konsistennya menunjukkan pemakanan dan gaya hidup sihat merupakan elemen yang penting dalam pencegahan kanser. Bukti ini telah diperkukuhkan lagi oleh *World Cancer Research Fund* dan *American Institute for Cancer Research* (2007). Internet menerusi emel dan laman web telah dikenalpasti sebagai satu saluran yang penting untuk komunikasi dan promosi kesihatan. Objektif kajian ini adalah untuk menentukan kesan intervensi menerusi emel dan laman web selama 10 minggu terhadap risiko kanser yang berkaitan dengan pemakanan dan gaya hidup di kalangan pekerja sebuah universiti awam. Sepuluh fakulti telah dipilih secara rawak untuk dijadikan sebagai kumpulan intervensi atau kumpulan kawalan. Kumpulan intervensi menerima emel yang mengandungi teks pautan kepada sebuah laman web pada setiap minggu, <http://www.nutrihealth-upm.com>, untuk memuat turun modul pembelajaran selama 10 minggu berturut-turut serta panggilan telefon secara individu manakala

kumpulan kawalan tidak menerima emel mingguan. Sepuluh modul pembelajaran mengenai pencegahan kanser dalam Bahasa Melayu telah dihasilkan mengikut garis panduan antarabangsa. Pekerja daripada fakulti terpilih disampel secara sistematik sebagai responden dengan izin (n=339). Penilaian peringkat awal dan selepas intervensi berkaitan dengan pemakanan dan gaya hidup telah dijalankan dengan menggunakan borang soal-selidik yang telah ditentukan. Kumpulan kajian ini (Intervensi, I=134; Kawalan, K=126) telah melengkapkan kesemua penilaian iaitu di peringkat awal, sebaik sahaja selepas intervensi (T1) dan tiga bulan selepas intervensi (T2). Di peringkat awal, tiada perbezaan yang signifikan untuk data sosio-demografi dan ekonomi, faktor-faktor risiko pemakanan dan gaya hidup (pengambilan makanan yang tinggi kandungan lemak, kurang pengambilan buah-buahan dan sayur-sayuran, merokok, pengambilan minuman beralkohol dan kurang aktiviti fizikal) dan pemboleh ubah berkaitan psikososial kecuali tanggapan mengenai kebaikan pengurangan pengambilan makanan berlemak dan peningkatan pengambilan buah-buahan dan sayur-sayuran di antara kumpulan intervensi dan kawalan. Pada T2, kumpulan intervensi menunjukkan sedikit peningkatan yang signifikan dalam saiz hidangan buah-buahan dan sayur-sayuran, jumlah aktiviti fizikal dan berjalan kaki. Peningkatan yang signifikan dalam pengambilan sayur-sayuran juga didapati di dalam kumpulan kawalan, tetapi tidak untuk aktiviti fizikal. Intervensi ini didapati tidak menunjukkan perubahan yang signifikan terhadap ukuran antropometri (berat badan, lilitan pinggang dan pinggul, indeks jisim tubuh dan nisbah lilitan pinggang dan pinggul). Tambahan itu, hasil kajian menunjukkan perubahan positif yang signifikan ( $p < .05$ ) untuk jumlah pengetahuan dan sub-topik (diet, aktiviti fizikal, pengurusan berat badan dan gaya hidup), persepsi tentang kesihatan dan risiko kanser serta faktor-faktor



psikososial (keyakinan diri dan tanggapan manfaat dan halangan) yang berkaitan dengan pengambilan makanan berlemak, buah-buahan, dan sayur-sayuran serta aktiviti fizikal dalam kumpulan intervensi pada T1 dan T2. Walau bagaimanapun, perubahan dalam pengetahuan dan faktor-faktor psikososial tidak menunjukkan korelasi di antara satu sama lain serta dengan perubahan risiko yang berkaitan dengan pemakanan dan gaya hidup. Kesimpulannya, keberkesanan intervensi emel dan laman web dalam meningkatkan tahap pengetahuan, persepsi dan faktor-faktor psikososial berkemungkinan akan melibatkan pekerja untuk mengubah risiko yang berkaitan tingkahlaku kesihatan walaupun elemen lain seperti persekitaran dan sokongan sosial juga diperlukan. Penggunaan internet merupakan satu cara untuk mendidik orang awam tentang pencegahan penyakit dan harus dioptimumkan kerana ia adalah suatu saluran komunikasi kesihatan yang berpotensi dan semakin mudah diperolehi oleh populasi orang dewasa.

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I certify that a Thesis Examination Committee has met on 24 June 2011 to conduct the final examination of Ang Yee Kwang on his thesis entitled “Effects of an Email-linked Website Intervention on Cancer-related Nutrition and Lifestyle Risk Factors among Employees of a Public University” in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the degree of Master of Science.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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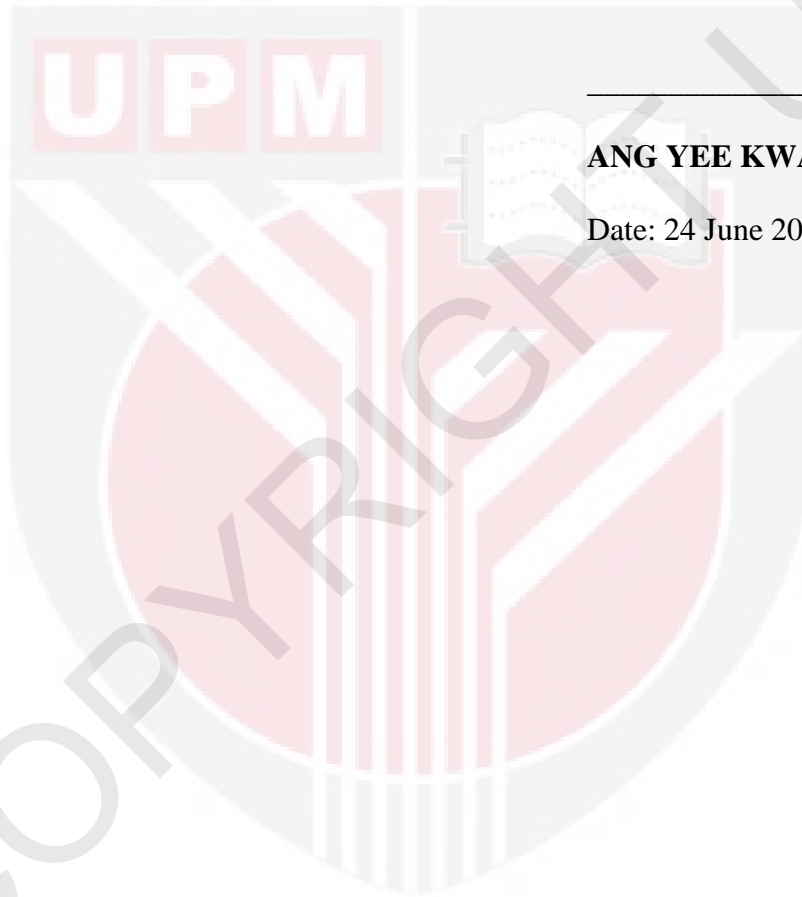
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## DECLARATION

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.



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**ANG YEE KWANG**

Date: 24 June 2011

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