



**Karolinska  
Institutet**

Stockholm 2012

**Institutionen för Medicin, Enheten för Klinisk Epidemiologi**

# **INTERNETIZED OBESITY TREATMENT - FROM RECRUITMENT TO PRACTICE**

**AKADEMISK AVHANDLING**

som för avläggande av medicine doktorsexamen vid Karolinska Institutet offentligen försvaras i föreläsningssalen Richard Doll, Eugeniahemmet (T3), Karolinska Institutet, Solna.

**Fredagen den 7 september, 2012, kl.09.00**

Av

**Madeleine Svensson**

Folkhälsonutritionist

*Huvudhandledare:*

Docent Ylva Trolle Lagerros  
Karolinska Institutet  
Institutionen för Medicin

*Bihandledare:*

Professor Emeritus Stephan Rössner  
Karolinska Institutet/Karolinska Universitetssjukhuset  
Institutionen för Medicin  
(f.d. Överviktsenheten)

Docent Rino Bellocco  
Karolinska Institutet/University of Milano-Bicocca  
Institutionen för Medicin/Statistics  
Enheten för Medicinsk Epidemiologi och Biostatistik

Professor Scott Montgomery  
Karolinska Institutet  
Institutionen för Medicin  
Enheten för Klinisk Epidemiologi

*Fakultetsopponent:*

Docent Dan Hasson  
Stockholms Universitet/Karolinska Institutet  
Stressforskningsinstitutet

*Betygsnämnd:*

Docent Marie Hasselberg  
Karolinska Institutet  
Institutionen för Folkhälsovetenskap  
Enheten för Global Hälsa/IHCAR

Docent Mikael Forsman  
Karolinska Institutet  
Institutionen för Folkhälsovetenskap  
Enheten för Arbets- och Miljömedicin

Docent Frode Slinde  
Göteborgs Universitet  
Institutionen för Klinisk Näringslära

## ABSTRACT

**Background:** The prevalence of obesity is reaching alarming altitudes worldwide, and the current healthcare systems face challenges to treat everyone. Thus, new strategies are of high priority. The Internet, for instance, has the potential to reach individuals irrespective of geographical location. Consequently, the overall aim of this thesis was to gain further understanding of the Internet's applicability in obesity treatment, targeting lifestyle-related health aspects.

**Methods:** This thesis has been built on four studies (I, II, III & IV). Study I used a *prospective cohort* design, examining members' program performance in an Internet-based weight loss club during six months of participation (n=23,233, 20% males), focusing on "active members" (n= 4,440, 18% males). Study II characterized a *randomized intervention study* (n= 3,876, 67% males) in which the participants received either Internet-based counseling (personalized automated health feedback) with or without added telephone counseling, compared with no counseling, on health behavior improvements. Study III was a *validation study* evaluating the ability of our newly designed Internet-based virtual food plate (with pictures of food items) to assess food intake (lunch meal). We compared the results with participants' (n=55, 100% males) composed meal of real food items on a real food plate. Lastly, study IV was a *descriptive study* of the effects of reminders (e-mails, flyers, oral presentations etc.) on overall participation in study II.

**Results:** The findings from study I suggest that older members ( $\geq 65$  years) performed equally well or better than younger members ( $< 65$  years). They logged-in and recorded their health more frequently, and reported a higher total weight loss (women: 5.6kg, 6.8%; men: 6.4kg, 6.8%). The results from study II indicate an overall health improvement from the intervention per se, rather than for specific interventions. However, those participants who received personalized automated feedback enhanced their motivation to change health habits at follow-up. Study III supports the validity of our Internet-based virtual food plate, with Spearman and concordance correlations ranging between 0.58-0.70 and 0.59-0.81 for energy intake and nutritional components, respectively. A slight overestimation using our virtual food plate was found (+310kJ), but less among overweight participants (+147 kJ). Finally, study IV completes this thesis concluding that a high number of reminders were effective on response rate, predominantly for those with high Internet availability. The participants' characteristics (age, BMI, motivation etc.), nonetheless, did not influence *when* they participated.

**Conclusions:** The Internet possesses unique potentials in obesity treatment. This thesis presents valuable effects on health improvements primarily on middle-aged or older, overweight men – a subgroup known to be challenging to include in health promoting activities. This work is only one of the building blocks in the investigation of the Internet's applicability in medicine. Future research is urged to continue searching the needs and preferences of Internet-based strategies targeting obesity.