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Dear Dr. Theerapol Topanthanon / Dr. Somsak Pattarakulwanich
We hereby send you copies of Vol. 3, Issue 1 of Clinical Health Promotion – Research and Best Practice for patients, staff and community, one for each member in your network and one for you.

Please distribute the journals to all members in your network.

Thank you in advance.

Best regards,

Hanne Tønnesen
Editor-in-Chief

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เพื่อโปรดทราบและกรุณาประชาสัมพันธ์ให้เจ้าหน้าที่ในหน่วยงานของท่านทราบ โดยสามารถเข้าไปดูรายละเอียดได้ที่ www.anamai.moph.go.th หัวข้องานวิเทศสัมพันธ์ หัวข้อย่อยความร่วมมือกับต่างประเทศ เรื่อง "วารสารปีที่ ๓ ฉบับที่ ๑ ของ Clinical Health Promotion" จะเป็นพระคุณ

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CLINICAL HEALTH PROMOTION

Research & Best Practice for patients, staff and community

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WHO-CC, Clinical Health Promotion Centre
Bispebjerg / Frb University Hospital,
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The South-eastern European Health Network

CLINICAL HEALTH PROMOTION

Aim

The overall aim of the journal is to support the work towards better health gain by an integration of Health Promotion into the organisational structure and culture of the hospitals and health services. This is done by significant improvement of a worldwide publication of clinical health promotion based on best evidence-based practice for patient, staff and community.

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The South-eastern European Health Network

Editorial

Can hospitals and health services do more for public health?

Hanne Tønnesen

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Patients, staff, management, health care providers, and politicians should ask if the hospitals and health services (H&HS) are really playing their role in the public health improvement to the best of their abilities.

Although health promotion should ideally take place outside of hospitals and health services as an integral part of people's everyday domains – in families, communities, workplaces, schools – the reality is very different. The majority of patients have unhealthy lifestyles that influence their current treatment results short-term and their outcomes in the long term, whereas clinical health promotion (ClinHP) has the immediate opposite effect. Therefore, the need for ClinHP is exceedingly high and hospitals and health services (H&HS) are certainly part of the real life solution.

The facts are very clear and worrying: Approximately four out of five hospital patients lead an un-healthy lifestyle, which is of major importance to their treatment outcome, quality of life, and life expectancy. Furthermore, approximately three out of five patients have two or more risk factors and therefore would need combined and comprehensive ClinHP programs (1). But are H&HS actually acting on these needs?

Today, it is well-known that integration of ClinHP in treatment programmes can cause significantly better treatment results. For instance, they make it possible to reduce complications after surgery and improve the results of treatment for non-communicable diseases (NCD) in the short term - and in the long term provide a significant health gain, which in turn benefits public health considerably (2;3). However, in many H&HS, this major potential is not fully utilised yet.

The integration of health promotion in healthcare has become a core issue world-wide, especially after the member state of the United Nations and World Health Organization Europe have signed new declarations, strategies, and action plans such as: "Health 2020", "Preventing and Control of Non-Communicable Diseases", and "Strengthening Public Health Capacities and Services" (4;5). For the World Health Assembly last year, a key goal was the reduction by 25% in premature NCD mortality (cardiovascular and respiratory disease, cancer, and diabetes) by 2025.

What all of the above have in common is the fact that they revolve around the well-known core risk factors of global disease burden and injuries. These are: Smoking, alcohol, overweight/nutrition, and physical in- or low activity, which are in fact both preventable and treatable and key elements in ClinHP (6). Thus, to live up to the challenges at hand, hospitals and health services should consider it among their core functions to implement health promotion, especially when society at large still has a long way to go in this field.

Although the year of 2025 may seem far away, when it comes to reaching the 25% reduction in premature death from NCD, 2025 is just around the corner. The international declarations and frameworks need to be translated into real action at all levels, nationally and sub-nationally. Furthermore, such action plans need to be in place and adapted to local conditions within a few years from now if they are to work. They also have to include all relevant partners and stakeholders nec-

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essary for a successful result within the limited time-frame. This is where hospitals and health services can add value, because in addition to the community-based prevention and disease control efforts, the ClinHP can play an important part.

Surprisingly good results have been published on health promotion performed inside the hospitals and health services (2;3). Furthermore, by systematic integration of health promotion activities in H&HS, you can also reach out to the otherwise unreachable groups, the most vulnerable patients, and those who are hit the hardest by inequity in health.

ClinHP is easy. The validated and easy-to-use tools from the International Network of Health Promotion H&HS and the World Health Organization facilitate the integration and evaluation of ClinHP. Today, you can count ClinHP interventions in line with number of surgical interventions – and it is possible to follow-up for effectiveness and cost-effectiveness via international documentation codes and integration into the most used reimbursement systems, such as Diagnoses Related Groups (DRG). The bridging between primary and secondary health care has been given priority in the tools, so that actions in one sector can be followed in the other. There are plenty of practical examples, since several countries have already integrated important elements of the tools into their national models for quality management and accreditation models (7).

During the last decade, ClinHP has moved from talk and development to real and hugely effective implementation of evidence-based activities, capacity building as well as to making actions visible and widely known. This is all included in the "Preventing and Control of Non-Communicable Diseases" and "Strengthening Public Health Capacities and Services".

So really, today hospitals and health services can do a lot more for public health.

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Research and Best Practice

Impact of a pedometer-based physical activity challenge on behavioral, biomedical, anthropometric and psychological outcomes in hospital employees: An interventional study

Charles Sounan[1], Melanie Lavoie-Tremblay[2], Kara Martin[3], Julie Trudel[2], Geneviève Lavigne[3], Ilka Lowensteyn[4], Steven A Grover[4]

Abstract

Background Health promotion programmes often incorporate the use of a pedometer to increase physical activity (PA). Although many studies have examined the influence of the pedometer on PA at the workplace, very few have directly targeted hospital employees and the anthropometric, biomedical, psychological, and behavioral benefits they could experience following a pedometer-based PA intervention. The aim of the present study was to examine the anthropometric, biomedical, psychological and behavioral benefits associated with the use of a pedometer in a PA challenge with a wide range of hospital employees.

Methods A total of 310 employees of a university-affiliated multi-site healthcare centre in Canada, from 24 to 70 years of age and of different types of jobs and work schedules, were voluntarily enrolled in an eight–week pedometer-based PA programme aimed at increasing PA as well as improving fruit and vegetable consumption. Data were collected at baseline and after the eight-week challenge using clinical measurements and questionnaires that were classified into five categories: socio-demographic, anthropometric, biomedical, psychological, and behavioral. Paired sample t-tests were conducted on the baseline and post-programme data to detect significant differences between the measurement points. Further analyses, including univariate analyses of covariance, were conducted on the post-programme scores to detect significant differences in the study variables between pedometer-determined PA groups.

Results Behavioral, biomedical, anthropometric and psychological benefits were associated with the PA intervention. Hospital employees also exhibited significant changes in anthropometric measures, such as lower weight and body mass index which is in line with previous studies. The present intervention also led to an increase in moderate PA and to a decrease in time spent sitting, to improvements in biomedical and psychological outcomes.

Conclusion The results highlight that the use of a pedometer is associated with significant increases in PA and significant decreases in weight, BMI, blood pressure and cholesterol as well as in stress, fatigue and sleep problems. This underscores the importance of such interventions in the hospital setting.

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Introduction

Physical activity (PA) is associated with many health benefits. Nonetheless, according to the World Health Organization (WHO), less than 40% of the world's population exercises (1). Physical inactivity is currently the fourth leading global risk factor for mortality and accounts for 6% of deaths and 2% of disability-adjusted life years worldwide (2).

There are many reasons why the workplace is the best setting for encouraging people to participate in PA. The workplace is available to all employees and a significant amount of time is spent there, making it an ideal environment with which to reach a large number of individuals and to modify employees' behavior (3;4). Also, workplace health promotion activities provide an opportunity to promote and advocate for the psychological and physical health benefits of PA (4).

When changes are made in the workplace, risk factors for chronic disease can be reduced and employees' health improved accordingly. There are also positive results for the employer, such as reduced absenteeism, lower accident rates,

improved efficiency and productivity, increased job satisfaction, more staff interaction, and better workplace morale (4-6).

Health promotion programmes often incorporate the use of a pedometer to increase PA. The pedometer, or step counter, is a small, light, electronic device that is generally clipped to an individual's clothing at the hip. It is a measurement tool which estimates distance traveled by foot by recording the number of steps taken. Pedometers are ideal for health promotion interventions because they are inexpensive, costing US$20 to US$35 apiece. As pedometers provide an approximate calculation of distance travelled by an individual, they are a simple and efficient way to measure PA. Health promotion programmes often set a goal of 10,000 daily steps to encourage increased PA (6). Pedometer programmes are often combined with motivational reminders, such as internet-based motivational messages, motivational interviewing or challenges to encourage a successful increase in PA (6;7).

The aim of the present study was to examine the benefits associated with the use of a pedometer in a PA challenge with hospital employees from all job categories. It was hypothesised that hospital employees would experience anthropometric, biomedical, psychological and behavioral benefits following the intervention and that taking all these outcomes into account simultaneously would help to better justify resource allocation for similar preventive intervention programmes for employees in the healthcare setting.

Method

Study Design

A pre-test and post-test study design was used to examine changes in behavioral, biomedical, anthropometric and psychological outcome questionnaires (8-14).

Recruitment

Participants were recruited in a university-affiliated multi-site healthcare centre in Canada comprised of six hospitals and one administrative site with over 10,000 employees. Recruitment took place at each site in areas frequented by most employees - such as the main entrance or close to the cafeteria in order to recruit staff with different types of jobs and work schedules. Interested employees booked an appointment for a pre-screening evaluation. Inclusion criteria included being a hospital employee and successfully completing the Physical Activity Readiness Questionnaire (PAR-Q). Individuals who answered yes to any question on the PAR-Q were further screened by a health professional. Candidates who were pregnant, had a cardiovascular disease, or a serious orthopaedic problem that could be made worse with exercise, needed clearance from a physician.

Intervention

The "Wellness Challenge" intervention comprised a one-hour on-site lunch lecture, 30-minute one-on-one pre- and post-evaluations during work hours and the eight-week pedometer activity challenge (September 19 to November 13, 2011). The activity challenge involved tracking step counts, step equivalents of other physical activities, as well as tracking fruit and vegetable consumption on a website. The lunch-hour lecture provided information on PA and nutrition as well as instructions on proper pedometer use. A goal of 10,000 steps and a goal of being the first site to cross Canada virtually as a group was used as motivators. The website allowed participants to see their progress as individuals, as a team and as an entire group (measurement of how many times they walked around the world). The website developed by the CHIP (Complete Health Improvement Program) team (comprised of trained and licensed facilitators) also provided health risk assessments and educational modules on various health factors—including cardiovascular disease, blood pressure, cholesterol, smoking, sleep, stress, depression, exercise, weight loss, and nutrition. Participants were invited to register with partners or as small groups, with colleagues from their department, to enhance social support. All eligible participants received a pedometer at the lecture and a code to access the programme website.

Assessments

Data were collected at baseline and after the eight-week challenge using questionnaires completed by participants (by mail and in person) as well as clinical measurements collected by trained staff during the pre- and post-screening evaluations at the workplace. Clinical measurements and questionnaires were classified into five categories (15): socio-demographic, anthropometric, biomedical, psychological and behavioral.

Socio-demographic

Date of birth, gender, smoking status, presence of cardiovascular disease (CVD) and diabetes, family history of CVD and diabetes, and current medications were collected at the pre- and post-screening evaluations

Anthropometric

Trained staff measured weight, waist circumference and height at baseline and at the end of the programme.

Biomedical
Blood pressure was measured by trained staff at both the pre- and post-screening. Two blood-pressure measurements were taken using an automatic blood-pressure monitor (Lifesource UA – 767) after five minutes of quietly sitting and the lower of the two blood-pressure values was used. Participants were given blood-test requisition forms six weeks prior to the start of the challenge and were invited to do a 12-hour fasting blood test at an MUHC hospital site prior to the baseline screening day. Two weeks before the end of the challenge, participants were given a second requisition form, to have the blood tests repeated. Blood measures included total cholesterol, LDL and HDL cholesterol, triglycerides and fasting glucose. Results were sent to a physician from the McGill Cardiovascular Health Improvement Program.

Psychological
Psychological questionnaires were completed by the subjects at the pre- and post-screening.

- Fatigue. Participants completed the four-item general fatigue subscale of the multidimensional fatigue inventory (8) on a five-point Likert scale. Cronbach's alpha was 0.80 at both baseline and post-programme.

- Insomnia. Participants completed the seven-item insomnia severity index (9). This questionnaire evaluates insomnia severity on the basis of difficulty falling asleep, difficulty staying asleep at night, difficulty waking up in the morning and daytime impairment. Items are scored on a four-point Likert scale. Cronbach's alpha was 0.89 at baseline and 0.85 at the end of the programme.

- Stress. Participants completed the 10-item perceived stress scale (10;11) at both measurement points. Sample item is "In the last month, how often have you been upset because of something that happened unexpectedly?". Cronbach's alpha was 0.88 at baseline and 0.89 at the end of the programme.

- Worklife. This questionnaire was completed both at baseline and at post-programme. Recently validated in both French and English (12), the Worklife Pulse survey is a 21-item questionnaire developed by Accreditation Canada and the Ontario Hospital Association. This survey provides a quick snapshot of a healthcare organisation's work environment and of employees' physical and psychological well-being. The survey is composed of four subscales: work environment, health, work adjustment, and absenteeism/health-related presenteeism. Cronbach's alpha varied between 0.64 and 0.92. All items are self-reported on Likert-type scales.

Behavioral (PA information)
Participants reported their daily steps on the website for the duration of the eight-week programme and were classified into pedometer-determined PA groups based on Tudor-Locke and Basett guidelines (13): sedentary participants were defined as those logging less than 5,000 steps per day, low active participants as those logging 5,000 to 7,499 steps per day, somewhat active participants as those logging 7,500 to 9,999 steps per day, active participants as those logging 10,000 to 12,499 steps per day and highly active participants as those logging more than 12,500 steps per day.

International Physical Activity Questionnaire (IPAQ)
Participants completed the short, self-administered format of the IPAQ for young and middle-aged adults (14) at both measurement points. This questionnaire is composed of questions assessing participants' physical activity level over the previous seven days. Participants are asked to indicate on how many days they did vigorous and moderate intensity PA and the number of days on which they walked for at least ten minutes at a time. Participants are further required to specify for how long they performed these activities on a typical day. Finally, participants are asked to report how much time they spent sitting on a typical week day. Continuous variables are created for each level of PA by weighting reported minutes per week within each activity category by a MET energy expenditure estimate assigned to each category of activity (for a detailed description of the origin of the MET levels (14)). A total MET variable is also created. The reliability and validity of the IPAQ is well documented (14).

To detect a medium effect size (Cohen's d of 0.5) with a statistical power of 0.80, it was estimated that a minimum total sample size of 130 participants was required. Given the longitudinal design of the study, the goal was to recruit at least twice this minimum total sample size at baseline (i.e., n=300).

Statistical analyses
Paired sample t-tests were conducted on the baseline and post-programme data to detect significant differences between the measurement points for the final sample. This analysis was preferred because it permits the detection of changes by comparing the exact same sample of participants at two measurement points. Furthermore, univariate analyses of covariance were conducted on the post-programme scores (while controlling for baseline scores) to detect significant differences in the study variables between pedometer-determined PA groups. All analyses were conducted with SPSS 20.0.

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Ethics
Participants gave written consent to participate. The study was approved by the healthcare organisation's research ethics committee (reference number 10-066-PSY).

Results
At baseline, 310 participants completed the pre-screening evaluation and 259 completed the blood test. During the pedometer programme, 76 participants were lost to attrition. At the end of the programme, 235 (75.5%) participants attended the post-screening; this sample size was large enough to confirm the statistical power of 0.80 (Table 1).

Table 1 Socio-demographics of final sample

Gender	92.3% female	
Age	Average = 47.6 (SD = 9.1), range from 24 to 70	
Job Title	Nurses	21.8%
	Technicians	12.7%
	Professionals *	16.2%
	Clerical services	25.8%
	Managers	10.5%
	Others **	13.1%
Experience	Average = 12.4 years (SD = 10.6)	
Work Full-time	87.4%	
Fixed daytime schedule	92.2%	
Takes blood-pressure medication	8%	
Familial history of cardiovascular disease	30%	
Familial history of diabetes	44.7%	

* e.g., advisors, staff consultants, staff officers, analysts
** e.g., research assistant, coordinators, personal support workers

It was found that a greater proportion of men failed to complete both measurements (38.7% of men and 20.2% of women completed only baseline measurements) and that participants who completed only the baseline measurements had higher stress scores (average = 16.1, SD = 7.0) than those who completed both measurements (average = 14.1, SD = 5.9, $t(1, 307) = 4.32$, $p = 0.038$).

Detailed paired-sample t-tests' results are shown in Table 2.

Anthropometric
A significant decrease in participants' weight and body mass index (BMI) was observed post-programme compared to baseline. Obese participants lost an average of 0.8 kg ($t(51) = 2.14$, $p = 0.037$).

Biomedical
A significant reduction in both systolic blood pressure and diastolic blood pressure was observed. Participants' total cholesterol also dropped significantly, which was primarily due to the significant decrease in low-density lipoprotein cholesterol. In addition, significant improvements were also noted in participants who had hypertension or abnormal blood lipids (total cholesterol) at baseline.

Psychological
Participants reported significantly lower levels of fatigue post-programme compared to baseline. Of the participants who had a baseline score indicating severe fatigue (higher than the 75th percentile), nearly 54% could be classified as normal post-programme. Similarly, a significant decrease in insomnia was also noted. At baseline, 13.3% of the sample were classified as having insomnia of moderate severity or worse while at post-programme only 6% were classified at this level. Stress levels were also found to be significantly lower post-programme compared to baseline. Paired sample t-tests did not show any significant differences between baseline and post-intervention values for work environment, self-reported health, work adjustment or absenteeism/health-related presenteeism.

Behavioral
Participants' total MET scores did not significantly change between baseline and post-programme. However, a significant decrease in time spent sitting was observed from baseline to post-programme. Furthermore, a significant increase was observed from baseline to post-programme in the number of days participants walked for at least ten minutes at a time.

On average, participants reported 12,428 steps per day (SD = 7,262). Table 3 shows the distribution of the participants in the pedometer-determined physical activity groups (13). Only 13.3% of participants were classified as low active or sedentary, and 54.5% were classified as either active or highly active.

ANCOVA showed significant differences in post-programme BMI between the pedometer-determined PA groups when controlling for baseline BMI ($F(4,227) = 2.84$, $p = 0.025$). BMI of the low active and the somewhat active groups were significantly higher than those of the active and highly active groups.

Similarly, significant differences in post-programme triglyceride were found ($F(4,166) = 2.44$, $p = 0.049$), where the post-programme triglyceride of the somewhat active group were significantly higher than those of the active

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Table 2 Clinical measurements & questionnaire variables at baseline and post-program (mean ± SD)

	Baseline	Post-program	t-value	p-value
Weight (kg)	72.40 ± 15.30	72.01 ± 15.04	3.09	0.002
Waist circumference (cm)	87.42 ± 11.50	86.72 ± 12.33	1.65	0.100
BMI (kg/m²)	26.80 ± 4.92	26.65 ± 4.81	3.09	0.002
Total cholesterol (mmol/L)	5.21 ± 0.90	5.12 ± 0.89	3.33	0.018
High-density lipoprotein cholesterol (mmol/L)	1.59 ± 0.43	1.58 ± 0.45	0.59	0.558
Low-density lipoprotein cholesterol (mmol/L)	3.15 ± 0.76	3.08 ± 0.74	2.20	0.029
Triglycerides (mmol/L)	1.08 ± 0.78	1.02 ± 0.62	1.27	0.207
Fasting glucose (mmol/L)	5.12 ± 0.97	5.08 ± 0.78	0.91	0.363
Systolic blood pressure (mmHg)	116.66 ± 15.46	114.62 ± 14.13	3.25	0.001
Diastolic blood pressure (mmHg)	76.77 ± 10.43	75.81 ± 9.41	1.87	0.063
Fatigue	11.70 ± 3.84	10.39 ± 3.64	6.04	0.001
Insomnia	7.70 ± 5.46	5.82 ± 4.48	7.37	0.001
Stress	20.56 ± 2.99	19.84 ± 3.03	3.69	0.001
Worklife Pulse: work environment	3.65 ± 0.75	3.61 ± 0.77	0.52	0.606
Worklife Pulse: health	3.46 ± 0.64	3.51 ± 0.67	-1.66	0.100
Worklife Pulse: work adjustment	3.78 ± 0.61	3.74 ± 0.64	0.99	0.326
Worklife Pulse: absenteeism/ presenteeism (total number of days)	6.59 ± 22.64	5.88 ± 18.00	0.63	0.531
Vigorous activity MET	930.72 ± 1779.08	923.57 ± 1855.35	0.05	0.957
Moderate activity MET	628.47 ± 1716.29	600.63 ± 1102.35	0.37	0.709
Walking MET	1407.50 ± 1938.21	1567.48 ± 1928.14	-0.60	0.548
Total MET score	2878.07 ± 3474.30	3041.86 ± 2914.56	-0.56	0.575
Days walking 10min	5.40 ± 1.93	5.87 ± 1.59	-3.08	0.002
Sitting (min/week day)	417.16 ± 240.15	352.82 ± 189.36	3.80	0.001

Table 3 Results of the ANCOVAs (mean ± SD)

	Sedentary	Low Active	Somewhat active	Active	Highly active
	n = 6	n = 38	n = 63	n = 71	n = 109
Post-program BMI	31.29 ± 7.68	29.02 ± 6.05	27.66 ± 5.00	25.82 ± 4.67	25.49 ± 3.616
Post-program triglyceride	0.78 ± 0.24	1.10 ± 0.54	1.29 ± 0.78	0.87 ± 0.39	0.95 ± 0.62
Post-program fatigue	13.30 ± 2.08	11.63 ± 3.82	11.40 ± 3.51	9.91 ± 3.94	9.54 ± 3.25

and highly active groups when baseline triglyceride levels were accounted for.

Significant differences in post-programme fatigue scores were also found ($F(4,228) = 2.76$, $p = 0.03$). Specifically, fatigue scores of the low active group were significantly higher than those of the active and the highly active groups. See Table 3.

Discussion

This study shows that the pedometer-based physical activity challenge had multiple positive health outcomes for a wide range of hospital employees. Specifically, behavioral, biomedical, anthropometric and psychological benefits were associated with the PA intervention. Hospital employees also exhibited significant changes in anthropometric measures, such as lower weight and body mass index, which is in line with previous studies (9;23;24;26). The present intervention also led to an in-

crease in moderate physical activity, a decrease in time spent sitting, improvements in biomedical outcomes (blood pressure and cholesterol levels), and psychological outcomes (lower stress level, less fatigue, and sleep problems). The present study was one of the few to look at the psychological impact of a pedometer-based PA challenge (27).

Over the last decade, a large number of studies in which a pedometer was used to assess PA in various populations (20-22) were published.

The pedometer has also been studied in workplace interventions for the promotion of PA (4). These studies demonstrate not only that a pedometer intervention can easily be incorporated into the workplace setting, but also that there are many benefits associated with such interventions, including behavioral, biomedical, psychological, and anthropometric benefits. For instance, some studies show that a greater number of daily steps correlates with a higher serum HDL cholesterol level and a lower ratio of total cholesterol to HDL cholesterol (21), with lower blood pressure (9) as well as with a decrease in BMI and waist circumference (9;23;26). However, there is little research that examines the impact of the pedometer on all these aspects simultaneously and few studies have investigated the psychological outcomes of a pedometer intervention. Furthermore very few have directly targeted hospital employees.

In a recent study (25), healthcare providers wore a pedometer and recorded their daily steps for 12 weeks which led to a reported increase of up to 200 minutes walked and up to 85 minutes in vigorous PA. Unfortunately, no psychological variables other than stress, which was shown to be lower post-intervention, were evaluated and no biomedical outcomes were measured.
In a study focusing exclusively on physicians, it was found that that physicians walked on average 6,010 steps daily at work (28). Two other studies (27;29) also revealed that physicians do not meet current guidelines for PA in the workplace and therefore need to incorporate exercise after work. These studies only measured the number of steps walked daily and no other outcomes were evaluated.

In the hospital employee pedometer studies mentioned above, the participants were almost exclusively physicians and very few variables were assessed.

Strengths and limitations of the study

A strength of this study is the high participation rate (75.5%). The study is also among the few that looks at the benefits of a pedometer-based intervention for various categories of hospital employees and takes into consideration behavioral, biomedical, anthropometric, and psychological outcomes.

The study has few limitations as well. The most important being the absence of a control group. Another limitation is the length of the intervention: the programme only lasted eight weeks. Also, the majority of the participants are women. Further, more dropouts are men, who were also more stressed at baseline, which may influence the generalisation of the results. Social desirability biases may have led to exaggerated reports of physical activity. However, the study also includes objective data (e.g., blood pressure measurements and blood tests). Furthermore, selection bias may have led to a sample of already highly motivated participants. However, the positive outcomes observed were influenced by the programme and not by changes in work environments as none were detected between pre- and post-programme.

Practical implications

This study indicates that implementing a pedometer-based intervention within a hospital setting is an excellent initiative for improving the physical and psychological health of hospital employees at a low cost. Furthermore, motivation and satisfaction with the programme were very high. Considering the positive impact on stress, fatigue, and insomnia demonstrated, this study is also relevant for workplace mental health prevention and management strategies to improve employee well-being. In addition, patients, relatives and the community can also benefit from such programmes that encourage self-management, self-care, and a better quality of life.

This study supports the concept of building health promotion capacity in hospitals and health services as outlined by the WHO International Network of Health Promoting Hospitals and Health Services (30).

Future studies

Future studies should be carried out with subsamples of hospital employees, with a control group, and with longer longitudinal designs.

Results of the analysis conducted for drop-outs show that the drop-outs were more often men than women and also more stressed at baseline. Future research is needed in order to determine if the same changes could be observed in a sample of male with high levels of stress.

Conclusion

In sum, this study substantiates the positive effect of a

pedometer-based PA challenge in many spheres such as behavioral, biomedical, anthropometric, and psychological. The study results underscore the importance of such interventions in the hospital setting and should provide incentive for other hospitals to introduce similar pedometer-based interventions to help keep their employees in good health physically and psychologically.

Contribution Details

Conception and design: CS, MLT, GL, JT, KM
Acquisition of data: KM, IL, SG, MLT, CS
Analysis and interpretation of data: GL, MLT, CS, JL, KM, IL, SG
Drafting the article: CS, MLT, JT, GL
Revising the article critically for important intellectual content: CS, GL, MLT
Final approval of the version to be published: CS, GL, MLT, IL, SG

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Research and Best Practice

Efficacy of a pain therapy protocol following gynaecological surgery

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Abstract

Background An adequate management of postoperative pain is an important guarantee for high quality care. The department of Gynecology at the University Hospital S. Anna in Ferrara (Italy) regularly monitors the intensity and treatment of pain using a dedicated form called "Treating pain together", complying with the recommendations of the local task force on pain "Pain-free Hospital and Land". The purpose is to evaluate the prevalence and intensity of pain in hospitalised women undergoing surgery by using a dedicated form and the efficacy of pain therapy protocols.

Methods 156 women undergoing gynecological surgery were examined, according to the type of surgical access (transversal laparotomy TL, longitudinal laparotomy LL, vaginal VAG), anesthesia and pain therapy. Pain was monitored three times a day during the first three days after surgery using NRS. Pain episodes were treated with painkillers when exceeding the intensity threshold NRS=3.

Results The prevalence of pain on day 0 was 15.8%, 19% and 31.6% for TL, LL and VAG respectively. During days 1 and 2 the values were respectively: 55.3% and 27.6% for TL, 52.4% and 50% for LL, 26.3% and 23.7% for VAG. The "due hours" painkillers administration scheme is related to a lower percentage of pain episodes, if compared to rescue doses.

Conclusion "Treating pain together" is a useful tool to systematically describe the different aspects of pain. It gives insight into this extremely subjective symptom and vital sign and helps improve therapy protocols when necessary.

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Introduction

Pain is defined by the International Association for the study of Pain (IASP) as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (1). Postoperative pain is the expected, undesirable by-product of all surgical procedures. Despite its universal occurrence, our understanding of its causes and our ability to treat postoperative pain is still incomplete (2). In women undergoing gynaecological surgery, postoperative pain can have different consequences: it can be severe, interfere with sleep and appetite, or result in chronic pain (3;4).

Several studies report that the management of acute postoperative pain is still ineffective and that different pain scales and criteria for assessment are used (4-11).

Most studies about gynaecological surgical procedures describe the outcome in terms of postoperative pain comparing the different approaches to surgery, from the least to the most invasive one (12-18).

Pain is a complex symptom, influenced by several factors. In the clinical setting, as well as in most published research, the measurement of its "intensity" suggests that this is most important dimension to assess and record (19).

A systematic and adequate management of postoperative pain is an important guarantee for high quality care (20;21). In Italy, particularly in the region of Emilia Romagna, it is a primary aim. S. Anna University Hospital in Ferrara has complied with the recommendations of the national project "Pain-free Hospital and Land" since its foundation, in 2001. The operators who join this project play an active role in improving assistance and treatment for hospitalised people, and the final aim is to promote the diffusion of the so-called "culture of pain" in which pain is handled on the same terms as other medical issues (22;23).

In order to comply with the recommendations of the "Pain-free Hospital And Land" task force on pain and in agreement with the national law n. 38/2010 (24), the Department of Gynaecology constantly monitors the intensity of pain in women who have undergone surgery, using a dedicated form, called "Treating Pain Together" (25;26;Appendix 1).

Objective

The aim of the study is to evaluate:

- the prevalence and intensity of pain in hospitalised women who have undergone surgery for gynaecological diseases, using a dedicated form called "Treating pain together"
- the efficacy of pain therapy protocols, based on expected pain.

Materials and Methods

Participants and Procedures

From February to December 2010, all patients referred to the Department of Gynaecology and Obstetrics at the S. Anna University Hospital, for a supposed benign gynaecological condition or a pre-malignancy, were recruited for the present study.

The indications for surgery were: uterine fibroids, benign pelvic masses, endometrial atypia, intraepithelial lesions of the uterine cervix, and uterine prolapse.

Exclusion criteria were: "Treating pain together" form not correctly filled in, patient displacement in other departments after surgery, a second surgery during the postoperative period.

All the surgical procedures were done during hospitalisation. For each patient, the clinical history was recorded.

All patients received an appropriate evaluation by the anaesthetist in accordance with the American Society of Anesthesiologists (ASA) classification in order to choose the most suitable anaesthesiology procedure: general, blended, spinal or combined spinal and epidural (CSE) anaesthesia.

The pre-surgical exams were prescribed on the basis of the hospital protocol: blood sample, electrocardiogram, chest X-Rays, and other procedures depending on the clinical needs of the patient. All received antibiotic prophylaxis with penicillin-derived drugs - if they were not allergic - gastric protection, and antithrombotic prophylaxis if necessary.

All surgical procedures were performed by the surgical team of the Department of Gynaecology and Obstetrics at the S. Anna University Hospital.

For each patient, we assessed: age, indication for surgery, type of surgery, length of postoperative hospitalisation, surgical access, anaesthesia, postoperative analgesic devices, postoperative analgesics administration scheme and number of pain episodes during the hospitalisation, especially during the first 72 hours after surgery.

Patients were divided into three groups depending on the surgical access: transversal laparotomy (TL), longitudinal laparotomy (LL) and vaginal access (VAG).

Surgical procedures were distinguished by being either demolishing or not demolishing, depending on whether hysterectomy was performed or not. All patients received painkillers according to hospital therapy protocols, applied on the basis of the expected pain, according to the Evidence-Based Medicine (EBM) and Evidence-Based Nursing (EBN) criteria. All protocols implied the use of a multimodal therapy with the association of opiates and NSAIDs.

Every patient was given an elastomeric pump containing painkillers (NSAIDs or a combination of NSAIDs and opiates), through continuous, fixed-dose, intravenous or epidural analgesic pump, during the first 24 hours after surgery (renewable). An additional analgesic administration scheme was prescribed to be administered at least during the first day after surgery. This consisted of intravenous painkillers according to a scheduled timetable (due hours) in addition to rescue doses if needed, or rescue doses alone, just in case of pain exceeding the threshold value NRS=3, as explained below. The most suitable scheme was chosen by the anaesthetist according to the patient's history and needs, the type of surgery and the intensity of the expected pain. After the first 24 hours, painkillers were given as rescue doses exclusively.

Pain Assessment

The data was taken from the "Treating Pain Together" form. This tool was introduced in December 2009 in some departments of S. Anna University Hospital, and gradually incorporated in all departments. It has been part of the clinical files of gynaecological patients (both surgical and not surgical) since January 2010.

The form was completed by the health care providers (medical and nursing staff) when the patient is admitted to the ward and updated at least three times a day, until discharge. Patients' experience of pain is reported in order to document the intensity, characteristics and

therapy of pain during the whole hospitalisation.

All patients were informed about the project and introduced to the "Treating the Pain together" form. They received information about pain and treatment, both orally and in written material. The members of the "Pain-free Hospital and Land Committee", represented by operators in every department of the hospital, were available for information when needed.

The chosen pain scale was the Numerical Rating Scale (NRS), on which 0 represents "no pain" and 10 "pain as bad as you can imagine". Scores 1-3 correspond to mild pain and did not represent need for analgesic therapy; scores 4-7 correspond to moderate pain and scores 8-10 to severe pain. The threshold value is NRS=3: beyond this value, the administration of rescue doses of painkillers is mandatory.

Every episode of pain higher than threshold was reported in a table: according to time, intensity, therapy and to the re-evaluation of the patient's pain after 30 or 60 minutes from the administration of the analgesic drug.

Pain trend, in terms of number of episodes and intensity, was analysed during the day of surgery (day 0) and the following two days (days 1 and 2). During this period, all groups were comparable within the duration of the hospital stay. For each patient, we considered the highest score on NRS among the three surveys recorded each day by the health care providers. The "mean NRS" value represents the average score among the highest scores of pain intensity of all patients, in the duration of days 0, 1, and 2 after surgery.

Statistical Analysis

Univariate and multivariate analyses were used to find variables potentially responsible for causing more pain episodes and affecting the need for rescue analgesia: "presence of an over-threshold episode of pain" was considered as a dependent variable. Independent variables were: age, demolition, surgical access, type of anaesthesia, prescription of painkillers every due hour or as a rescue dose.

The statistical analyses were done separately for each day, since the parameters could change over time: during day 1, the painkillers administration scheme changed because some women, who got analgesics every due hour during day 0, received only rescue doses the following days.

All the involved surgical procedures foresee a "moderate intensity" expected pain, classified on the Numerical Rating Scale with values between 4 and 7.

The statistical analysis was performed using StatGraphics statistical package v.4 Rockwell (MA) USA and SYSTAT v. 5 Evanston, (IL) USA. Contingency tables m x n were tested by the Chi-square test, or by the Fisher's exact test if needed.

The trends of numerical variables on an interval-scale were checked with simple linear regressions, while the differences between mean values of groups and subgroups were compared using one way Analysis of Variance (1-way ANOVA) or, for non-normal distribution by mean value comparison, using the graphical Notched Box & Whiskers test. The contribution of different variables referring to single binary variables was calculated by univariate and multivariate logistic regression.

Differences in mean or median values were considered significant when the alpha error (type I error) held less than 0.05.

Results

From 1 February to 31 December 2010, 169 women underwent gynaecological surgery by laparotomic or vaginal access, with a moderate expected pain (NRS 4-7).

13 patients were excluded: 10 because of the absence of the Treating pain together form in the clinical file (at the very beginning of introducing the tool); 2 were displaced in the Intensive Care department because of general comorbidity, and 1 needed a second surgery during the postoperative period.

The accepted sample consisted of 156 women.
The sample was divided into three groups, according to the surgical access:

1. Transversal laparotomy (TL), n=76.
2. Longitudinal laparotomy (LL), n=42.
3. Vaginal access (VAG), n=38.

The sample is presented in Table 1.

Anaesthetists decided on different kinds of painkillers administration in addition to continuous infusion, based on the hospital therapy protocol, influenced by the history, the characteristics of the patients, surgical procedures and expected pain. In the TL group, 41 (54%) received painkillers every due hour and 35 (46%) received rescue doses. In the LL group, 21 received due hour (50%) and 21 rescue administration (50%). In the VAG group, 20 received due hour (53%) and 18 rescue (47%) administration.

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Table 1 Age and duration of postoperative hospitalisation description in different surgical accesses

Surgical access		n°	%	Age mean	Age SD*	Age median (range)	Postoperative hospitalisation (days) mean	Postoperative hospitalisation (days) SD*	Postoperative hospitalisation (days) median (range)
Transversal laparotomy	TL	76	48.7	48.6	± 11.7	48.0 (19-81)	4.8	± 1.1	5 (2-8)
Longitudinal laparotomy	LL	42	26.9	63.2	± 13.1	62.5 (35-83)	6.7	± 2.7	6 (4-17)
Vaginal access	VAG	38	24.4	65.8	± 7.9	66.5 (47-78)	4.4	± 1.9	4 (2-13)
TOTAL		156	100.0	56.7	± 13.8	55.0 (19-83)	5.2	± 2.1	5 (2-17)

*SD = standard deviation

The chi-square analysis did not reveal any significant difference between the three surgical accesses in terms of demolition.

Only one major complication associated with surgery occurred: one episode of febrile morbidity during day 2 after a transversal laparotomy. Results obtained from "Treating pain together" did not show any evidence of any association with increased pain.

Post-Operative Pain Episodes

Day 0

The pain prevalence and mean intensity during day 0 is described in Table 2.

Most women did not complain of pain episodes. However, in the VAG group, a higher number of pain episodes is evident when compared to both laparotomies (TL, LL) and the p value indicates some borderline significance ($p = 0.14$) about this relation.

The mean value of pain intensity was higher in the VAG access ($p < 0.01$) considering only women who complained of at least one episode of over-threshold pain (Figure 1).

Univariate analyses did not highlight any significant relation. A borderline, close to significance result has been observed between the VAG access and the possibility of having more pain episodes if compared to laparotomies ($p = 0.06$), with Odds Ratio (OR 95%) of 2.5.

The multivariate analysis were inconclusive. However, a borderline relation between the presence of hysterectomy and the possibility of having more pain, if compared to non-demolishing surgery ($p < 0.09$) was observed.

Day 1

The pain prevalence and mean intensity during day 1 is described in Table 3.

The prevalence of pain episodes in VAG was significantly lower if compared to both laparotomies ($p < 0.02$).

The univariate logistic regression, considering surgical access, showed an OR 95% of 0.29 in VAG during day 1. Pain incidents were three to four times less probable if compared to both the laparotomy groups ($p < 0.005$).

A preventive effect was also evident in the use of pain-killers every due hour if compared to rescue doses ($p < 0.001$), with an OR 95% of 0.20, demonstrating that incidents of pain are about 5 times less likely to occur when following the due hour administration scheme.

Multivariate logistic regression showed a connection between the same two parameters: surgical access and method of analgesics administration. Both the "due hour" administration and the vaginal access during day 1 reduced the risk of experiencing pain, with an OR 95% of 0.17 ($p < 0.01$) for the first parameter, and an OR 95% of 0.23 ($p < 0.005$) for the second one.

Day 2

The values of day 2 are represented in Table 4.

During day 2, the clinical condition of patients in both the TL and VAG groups improved, while the percentage of women feeling pain remained high in LL, with over-threshold pain episodes in 50% of the sample ($p < 0.05$).

There were no significant differences among the three groups in terms of pain intensity.

The pain prevalence and intensity is described in Figure 2a, 2b.

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Table 2 Pain episodes and average intensity during day 0

	TL (tot 76)			LL (tot 42)			VAG (tot 38)		
PAIN ON DAY 0	**n°**	**%**	**mean NRS***	**n°**	**%**	**mean NRS**	**n°**	**%**	**mean NRS**
NO episodes	64	84.2	-	34	81	-	26	68.4	-
≥1 episodes	12	15.8	5.6 (4-7)	8	19	6.3 (5-7)	12	31.6	7.2 (5-9)

Chi-square distribution: pain episodes–surgical access $p < 0.14$; Chi-square distribution: pain intensity–surgical access $p < 0.01$
*Numerical Rating Scale

Table 3 Pain episodes and average intensity during day 1

	TL (tot 76)			LL (tot 42)			VAG (tot 38)		
PAIN ON DAY 1	**n°**	**%**	**mean NRS**	**n°**	**%**	**mean NRS**	**n°**	**%**	**mean NRS**
NO episodes	34	44.7	-	20	47.6	-	28	73.7	-
≥1 episodes	42	55.3	5.7 (4-8)	22	52.4	6.09 (4-9)	10	26.3	6.5 (5-8)

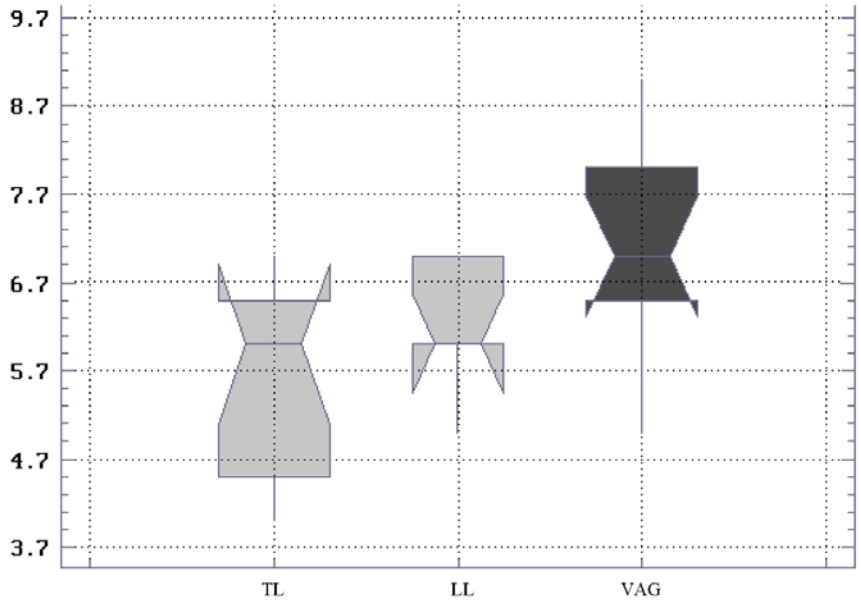
Chi-square distribution: pain episodes–surgical access $p < 0.02$
Chi-square distribution: pain intensity–surgical access $p < 0.14$

Table 4 Pain episodes and average intensity during day 2

	TL (tot 76)			LL (tot 42)			VAG (tot 38)		
PAIN ON DAY 2	**n°**	**%**	**mean NRS**	**n°**	**%**	**mean NRS**	**n°**	**%**	**mean NRS**
NO episodes	55	72.4	-	21	50	-	29	76.3	-
≥1 episodes	21	27.6	5.7 (4-9)	21	50	5.8 (4-7)	9	23.7	6.3 (5-8)

Chi-square distribution: pain episodes–surgical access $p < 0.02$
Chi-square distribution: pain intensity–surgical access $p < 0.35$

Figure 1 Maximum pain intensity in women with intensity value >3 on NRS (Day 0). Graphical Notched Box & Whiskers test



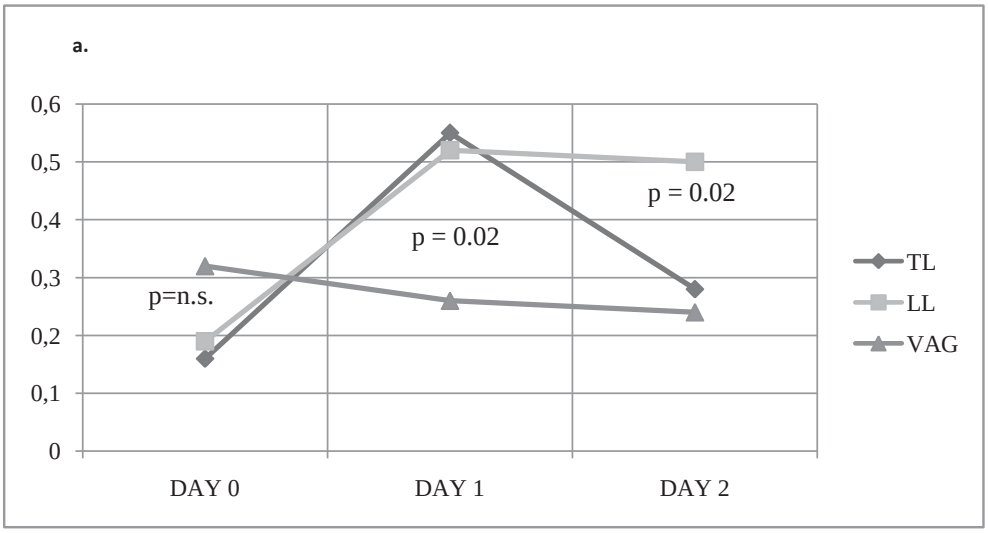
64% (100/156) of the women complained of at least one episode of postoperative pain during the first three days after surgery, independently of the type of surgical access. In this group, the 89% (89/100) had moderate pain (NRS 4-7) and the 11% (11/100) reported severe pain (NRS 8-10).

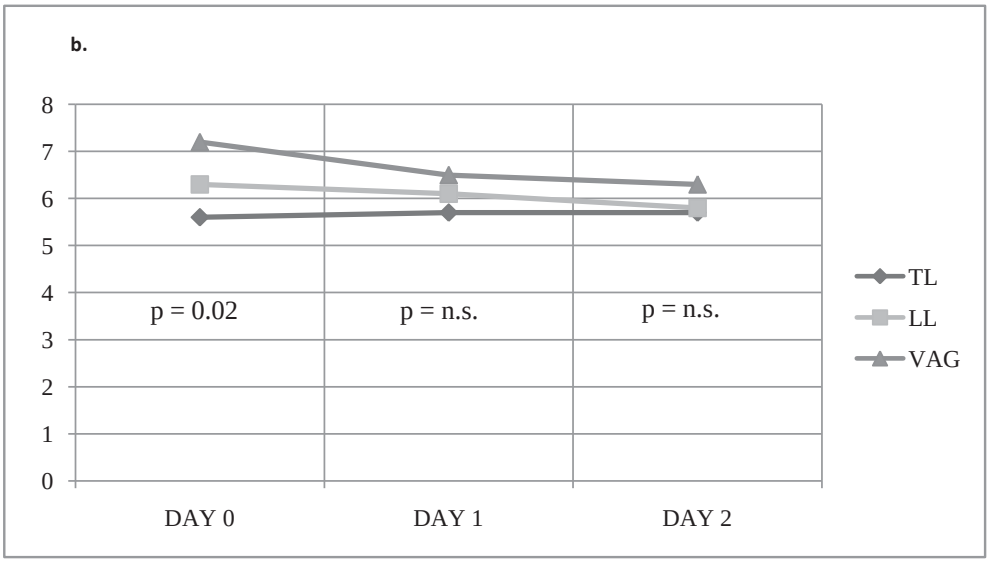
Discussion

The increasing attention on pain and its treatment, confirmed by the recent Italian legislation (24), has inevitably started actions and initiatives in order to improve the evaluation and monitoring of this problem and to reduce its occurrence. In our department, we applied the guidelines of the national project called "Pain-free Hospital and Land" (21).

This study on pain episodes in women after gynaecological surgery gave important results: the prevalence of pain (NRS>3) during the first three days after surgery was 64% (100/156), independently of the surgical access. The pain intensity ranged from moderate to severe, on the NRS. However, it is difficult to compare our results to other studies, because of the characteristics of the sample and the surgical area.

Figure 2 a. Pain prevalence and surgical access during the first three days after surgery;
b. Pain intensity in the Numerical Rating Scale and surgical access during the fist three days after surgery.





Prevalence of pain varies considerably in the literature: 25% by Good (4), 78% by Shen (5), 76% by Svensson (6), 80% by Apfelbaum (7), 62% by Costantini (8), 46% by Coucerio (9), 59% by Melotti (10), 2,2% by Moizo (11).

Other studies about pain after gynaecological surgery are not comparable with our results, because of the differences between the type and extension of the surgery, analgesic therapy, time after surgery and presence of other promoting factors (12-18). All these studies use different measuring scales, so it is difficult to assess and compare pain intensity systematically.

Our results regarding intensity seem important: women complained about severe pain only in few cases, generally in the VAG group during day 0. However, the final results showed that the VAG access had the best outcome in terms of percentage of pain episodes, if compared to laparotomies, coherent with the literature (27;28).

The continuous, regular and careful monitoring of pain (its intensity, development and treatment), allowed the detailed description of the postoperative care situation in women in the gynaecological department. The use of the "Treating Pain Together" form in every department of Ferrara University Hospital and dedication to treating and minimising post-operative pain was useful in order to reach this aim.

This study shows that patients undergoing gynaecological surgery suffer sufficient post-operative pain to be in need of intervention.

A further goal could be to attend to these critical points identified in this study: to relieve pain in women in the VAG group during day 0, in the TL group on day 1 and in the LL group on day 2.

Conclusions

The current study demonstrates that the reduction of postoperative suffering is an important indicator of a high level of health care and life quality.

The strength of this study is the use of the dedicated form "Treating pain together", a useful tool to assess and monitor pain intensity and find the adequate response to its treatment, regularly and continuously. Pain is an extremely subjective symptom and a vital sign, and its detailed description can help with the improvement of therapy protocols when necessary.

Adequate information dedicated to women hospitalised in a gynaecological department and the awareness of postoperative pain among the sanitary operators gave important results in terms of relief from suffering in operated women.

Contribution Details

Conception and design: TM, RM, CB
Acquisition of data: CB
Analysis and interpretation of data: CB, TM, RM, PC
Drafting the article: TM, RM, CB
Revising the article critically for important intellectual content: TM, RM, FG, PC, RZ, AP
Final approval of the version to be published: TM, RM, CB, FG, PC, RZ, AP

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Appendix 1 available online at www.clinhp.org

Research and Best Practice

Influence of acute alcohol intoxication on certain immune reactions

Hanne Tønnesen[1], Nina Sass[2], Karin Hoborg Juhl[3], Hans Jørgen Nielsen[4]

Abstract

Background Long-term alcohol abuse is a potent immunomodulator, and alcohol abusers have increased risk of bacterial infections after surgery. In experiments, acute alcohol intoxication suppresses certain immune reactions and may co-act with trauma to increase risk of post-trauma infectious complications. The aim was to evaluate immune reactions during, an evening of social drinking.

Methods We studied 13 healthy, non-smoking volunteers having red wine (1 g of ethanol/kg body weight) with a three course dinner. Delayed type hypersensitivity (DTH) skin test, plasma plasminogen activator inhibitor-1 (PAI-1), plasma myeloperoxidase (MPO) and plasma histamine, representing parts of the immune response with specific relation to the host defence against bacterial antigens, were tested two weeks before the dinner, immediately prior to the dinner, when the blood alcohol level peaked, and one week after the dinner. The volunteers abstained from alcohol in the two weeks leading up to the dinner and one week afterwards.

Results The median peak blood alcohol level reached 92 (51-124) mg/dl, equivalent to 20 (11-27) mmol/l. No change in the DTH response was found, $p = 0.76$. PAI-1 concentration in plasma increased significantly from 3 (1-13) ng/ml just before dinner to 20 (5-75) ng/ml at the time of alcohol peak level, $p < 0.01$. Similarly, plasma histamine increased from 5.8 (4.7-10) nmol/l to 7.1 (5.6-10) nmol/l, $p < 0.01$ and plasma MPO decreased from 96 (42-158) to 91 (41-125) ng/ml, $p < 0.05$. After one week of abstinence, PAI-1, histamine and MPO returned to pre-dinner level.

Conclusion The study showed significant changes in various parts of the host's defence to bacteria following acute alcohol intoxication. Potentially, this may be detrimental for patients, who have been traumatised at injury or surgery during alcohol intoxication, by contributing to enhanced susceptibility to post-trauma bacterial infectious complications.

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Introduction

Alcohol abuse leads to impaired immune response (1), and long-term alcohol abusers have increased risk of developing infections and neoplastic diseases (2;3).

Furthermore, acute alcohol intoxication has been found to be immunomodulatory in animal experiments. The cell-mediated immune response seems to react to alcohol in a dose dependent manner, and so low doses of ethanol may stimulate the immune response temporarily, while high doses may reduce the cellular immunity (4;5). In addition, acute ethanol intoxication is known to inhibit neutrophil delivery to sites of inflammation, reduce adherence of neutrophils to endothelial cell surfaces, transiently suppress chemotactic function and reduce the bactericidal ability to kill Staphylococcus aureus, when doses of 3 g/kg of ethanol or higher are administered experimentally (6;7). Similar concentrations of ethanol (25-100 mM) induces monocyte and macrophage synthesis of interleukin-10 (IL-10) and impairs tumor necrosis factor (TNF-α) synthesis, which may contribute to an early inhibition of inflammatory response to bacterial stimuli (8;9). This appears to inhibit the ability to clear bacteria and predisposes to infections in animals (10).

However, the knowledge of the effect of acute alcohol intoxication on various parts of the immune system in humans is sparse. Therefore, we studied the influence of social drinking and dining on parts of the immune response with particular emphasis on the bacterial immune defence (Table 1).

Materials and Methods

After signing an informed consent, 13 (8 men, 5 women) non-smoking, non-alcohol abusing healthy volunteers abstained from alcohol for two weeks leading up to and one week after the scheduled drink-

Research and Best Practice

Table 1 Blood components and immune analyses used to measure effect

Effects on	Measured by
Neutrophils	Myeloperoxidase, Interleukin-6
Basophils	Histamine
Monocytes	Interleukin-6, Myeloperoxidase
Platelets	Plasminogen activator inhibitor-1
T-lymphocytes	Delayed type hypersensitivity, skin test

ing event. Median age was 28 (range 18-65) years and body mass index was 23 (20-29) kg/m^2. None of the volunteers used medication and all were without a history or clinical signs of illness. Their usual alcohol intake was 1 (0-1) drink per day.

The study was approved by the Scientific Ethical Committee of Copenhagen (no. 01-401/96).

Alcohol Administration and Dinner

After two weeks of complete abstinence ensured by 800 mg disulfiram at inclusion, the volunteers consumed between 650 and 1000 ml of red wine (Spanish, 12.5 %) corresponding to 1.0 g of ethanol per kg body weight (i.e. 5.3 to 8,1 standard drink of 12 g ethanol) together with a three course dinner during a two hour study period. The dinner was composed of salmon, chicken with rice, and chocolate cake. Non-alcoholic beverages were available during the study period without any volume restrictions. The "happy evening" was followed by another week of abstinence from alcohol.

Blood Alcohol Level (BAL Determination)

Just before the study period, serum ethanol was analysed using the enzymatic method (Vitros, Johnson and Johnson, NY, USA). After finishing the alcohol drinking, BAL was monitored every ten minutes using the breath analysis (Lion Alcometer, Palmenco A/S, Denmark) and when BAL peaked, serum ethanol was determined again.

Blood Sampling

Blood samples were collected from a cubital vein at inclusion and analysed for B-leucocytes (Technicon, H3, Bayer, NY, USA), S-creatinine, S-albumin, S-transferrin, S-bilirubin, S-alkaline phosphatase, S-ALAT and S-amylase (Vitros, Johnson and Johnson, NY, USA)
Blood was drawn before the study, immediately after reaching peak BAL, and after one week of abstinence, and put into ice-chilled endotoxin-free tubes (Becton-Dickinson, Mountain View, CA, USA) containing 0.5 ml sodium citrate (0.129 mol/l), and subsequently the blood was centrifuged at 4°C at 1200 G/10 minutes. The plasma was carefully separated from the cells, leaving at least 1 ml plasma on the top of the cell pellet and frozen at -70°C until analysed.

The following analyses were performed in duplicate using commercially available kits. The concentration of histamine was analysed by ELISA method (Immunotech SA, Marseilles, France); the detection limit was 0.5 nmol/l. PAI-1 was analysed by using a commercially available ELISA method (Monozyme, Hørsholm, Denmark) (11); the detection limit was 20 pg/ml. MPO by RIA (MPO RIA, Pharmacia & Upjohn AB, Uppsala, Sweden) with a detection limit of 8 ng/ml and IL-6 by ELISA (IL-6, Immunotech SA) with detection limit of 3.9 pg/ml.

Delayed Type Hypersensitivity (DTH)

DTH was measured by a skin test (Multitest ®, Pasteur Mériux SA, Lyon, France) that consisted of a plastic device capable of simultaneous application of a negative control of glycerine-saline diluent and seven DTH antigens: tetanus, diphtheria, streptococcus, tuberculin, candida, trichophyton, and proteus. The skin test was applied on the flexor surface of the forearm in the two week abstinence period, immediately before the dinner, and one week after. The cutaneous response was read 48 hours after the application and expressed as the sum of all indurated areas with a diameter of at least 2 mm.

Statistical Methods

The results are given in median and range values. The Wilcoxon Rank sum test was used for the paired data. The level of significance was $p \leq 0.05$.

Results

BAL measured by breath test was 0.0 in all volunteers before entering the study. During the drinking event, the peak level reached 16 (ranging 10-23) mmol/l. When BAL measured by breath test peaked, serum ethanol was 20 (11-27) mmol/l. B-leucocytes, S-creatinine, S-albumin, S-transferrin, S-bilirubin, S-alkaline phosphatase, S-ALAT and S-amylase were normal in all volunteers at study entry. During the "happy evening", the total leucocyte count increased significantly from 5.4 109cells/l (4.7-10.5) to 6.6 (5.9-10.7), $p < 0.01$, due to a significant increase in total lymphocyte count from 2.3 109cell/l (1.6-3.1) to 2.7 (1.9-3.5), $p < 0.01$. S-albumin and S-alkaline phosphatase were significantly increased, $p < 0.05$, while S-bilirubin decreased, $p < 0.01$. Granulocyte count, S-creatinine, S-transferrin, S-ALT, and S-amylase did not change.

The most marked difference between pre- and post-trial immune parameters was observed in platelet derived PAI-1 (Figure 1a). We also found a small but significant increase of plasma histamine (Figure 1b), and a small but significant decrease of MPO (Figure 1c). Both P-his-

tamine and P-MPO returned to pre-study levels during the following week of abstinence.

Plasma IL-6 was undetectable in all volunteers throughout the study.

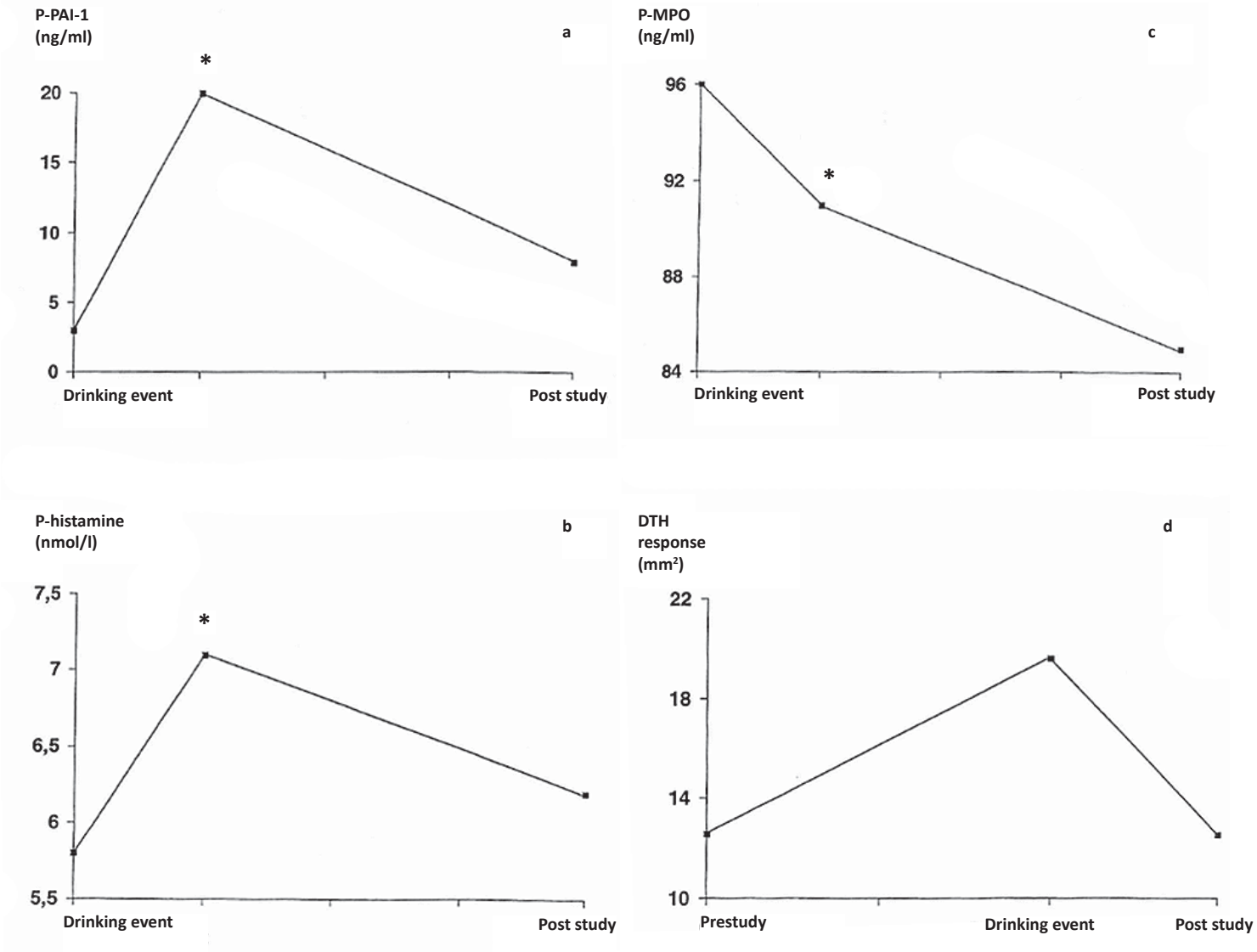
Delayed type hypersensitivity was not affected by the alcohol intoxication, p= 0.76 (Figure 1d).

Discussion

We found that the plasma concentrations of PAI-1, Myeloperoxidase and histamine increased significantly after acute alcohol intoxication. After one week of abstinence, the values returned to pre-dinner level.

Parts of the host defence have been investigated in relation to social drinking (8;12-16). Mandrekar et al evaluated the effect of a minor intake over 18 hours in humans, corresponding to less than one tenth of the intake in our study. They found attenuated monocyte inflammatory responses through inhibition of nuclear regulatory factor kappa B and induction of interleukin 10. Corberand et al. found, while examining neutrophil function, only a moderately and reversible depression of S. aureus phagocytosis by neutrophils (12). In a similar setup, Mohadjer et al. found small changes in cytokine levels, lymphocyte subpopulations, and mitogen stimulation (13). In another study, IL 2-induced lymphokine-activated killer activity was significantly reduced compared with activity before alcohol ingestion, but natural killer activ-

Figure 1 Immune alterations during drinking event and poststudy. a) Plasminogen activator inhibitor-1 (PAI-1). b) Histamine. c) Myeloperoxidase (MPO). d) Delayed type hypersensitivity (DTH). *: p < 0.005.



ity was not affected. The alcohol amount ingested was small and BAL only reached 11-47 mg/dl (14). Veenstra et al. reported alteration in platelet function with a significant increase in plasma PAI-1 in the postprandial phase after drinking 30 g of alcohol (15). Increased plasma levels of PAI-1 have been found to impair fibrinolysis and potentially contribute to the formation of atherosclerosis and stroke (16;17). Both alcohol and food play a role in stimulating platelets to release PAI-1 (15;18;19). Minor intake of ethanol increases PAI-1 with about 10% (15), transient 20-50% time increase has reported after a carbohydrate rich meal (18;19), while a fat rich meal appears to be without influence (19). The sevenfold increase of PAI-1 in our study is probably a result of the higher alcohol ingestion, 1.0 g/kg bodyweight.

Histamine released from basophils and mast cells appears to participate in the regulation of the immune response. Thus, in physiological concentrations it may act as an immunostimulatory molecule (20), while increased concentrations may lead to immunosuppression (21). The small, significant increase of plasma histamine observed in our study is similar to the increase observed in patients with septicaemia (21) and in patients undergoing major surgery (22). Such concentrations may play a stimulatory role in inflammation (23) and may even impair neutrophil chemotaxis and T-lymphocyte proliferation in healthy volunteers (24). Furthermore, histamine in increased levels modulates various other pathologically processes (20).

Myeloperoxidase is an enzymes released by neutrophils when activated in immune reactions (25) and it may play a significant role in various pathophysiologically processes. Although significant, the decrease in plasma MPO observed at the peak alcohol level in our study is within the normal range observed in healthy, non-alcoholic volunteers (26). Therefore, the decrease may be normal variation, or it may be due to increased enzyme activity following increased levels of oxygen, free radicals induced by alcohol consumption (27).

We found no significant changes in cellular immunity and plasma IL-6, indicating that BAL normally reached in social drinking is too small to influence T-lymphocyte functions. In vitro experiments and animal studies confirm that a non-physiological level of serum ethanol has to be reached before a marked suppression of lymphocyte function can be found (4;5;28;29). Ethanol in physiological concentration seems to stimulate the immune system and improve host defence (29).

The elicited alterations of the immune defence and the consequences in a clinical situation when alcohol intoxication is followed by trauma are still not clear. Growing evidence showed that acute alcohol intoxication may co-act with trauma to increase post-trauma immunosuppression and risk of infection (30). Therefore, it still remains to be studied in more detail whether alcohol consumption in otherwise healthy people plays a significant role in enhancing the risk of complications for intoxicated traumatised patients. The small, but significant changes found in our healthy volunteers may eventually play a certain role, which potentially may be amplified with increased drinking. Further clinical studies are needed to clarify the effect of alcohol not only on healthy volunteers, but also on non-healthy people who are consuming alcohol.

Contribution Details

Conception and design: HT, NS,
Acquisition of data: HT, NS
Analysis and interpretation of data: HT, NS, KHJ, HJN
Drafting the article: HT
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Competing interest: None declared.

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International Master in Health Promotion in Hospitals and Health Services - update

About the Master

The master is provided by WHO-CC for Evidence-based Health Promotion for Hospitals and Health Services in collaboration with a number of renowned Universities.

Courses are expected to begin in 2014.

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Due to a new European accreditation system for educational programmes, the development and thus the start-up of the proclaimed Master of Clinical Health Promotion has been delayed for a year.

As a result of the new accreditation system, the Master will be accredited in accordance with other university educational programmes and be worth a total of 60 ECTS point, which complies with the rules under the University Act.

WHO-CC for Evidence-based Health Promotion for Hospitals and Health Services (WHO-CC) are in dialogue with ACE Denmark, the Danish Accreditation Institute, who survey Danish applications on behalf of the European Committee. Also, WHO-CC has initiated a new partnership with University of Southern Denmark, who will take part in the development as organising partner along with the existing partners; Lund University (Sweden), Charité - Universitätsmedizin Berlin (Germany), and University of Oslo (Norway).

Many of the International HPH Networks' member hospitals and health services have registered staff to participate in the development of the programme and with participation in the teaching activities. WHO-CC is pleased with the great support they have received from the International HPH Network and the many members.

Research and Best Practice - New PHD Theses on Clinical HP

Inter-organisational networks in the settings approach of health promotion

The case of the International Network of Health Promoting Hospitals and Health Services (HPH)

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Key title:
Interorganizational networks in the settings approach of health promotion

The thesis can be downloaded from www.lbihpr.lbg.ac.at/webfm_send/499

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"Networks" is a buzz word in the social sciences. In health promotion, networks have become practice tools to support the dissemination and implementation of health promotion since the late 1980s in as diverse settings as cities, hospitals, schools, islands, market places, and prisons. However, despite more than 20 years of experience with networks in the settings approach of health promotion, theory-informed concepts of network effectiveness, which can guide the planning of network coordination and interventions, are still widely missing (1).

This also holds true for the International Network of Health Promoting Hospitals and Health Services (HPH) which was founded in 1990, and its national and regional sub-networks that now exist around the globe. While, in 1995, the WHO Regional Office for Europe decided to make national and regional networks of HPH the main tools for further dissemination of HPH and for supporting implementation in hospitals and other health services (2), research in HPH continued to focus on the hospital level, and no international comparative study of the National/Regional networks of HPH has existed until now (3).

Research questions

Against this background, between 2008 and 2012, the "Project on a Retrospective Internationally Comparative Evaluation Study in HPH" (PRICES-HPH), coordinated by the WHO Collaborating Centre on Health Promotion in Hospitals and Healthcare at the Ludwig Boltzmann Institute Health Promotion Research in Vienna, Austria (3;4), provided an ideal background for a dissertation project to study the following research questions:

- How can a better theoretical understanding of health promotion networks be developed and used to inform an effectiveness framework for health promotion networks?
- To which degree does the framework help to analyse and interpret data on the effectiveness of National/Regional HPH networks?
- Can recommendations for network coordination and interventions be formulated on these grounds?
- Which capacities can be identified to support the effectiveness of HPH networks?

Methods

Research methods comprised several literature searches and two surveys (based on self-administered questionnaires) to collect data on HPH networks and their member organisations. In total, data from 28 networks and 180 member organisations were available for analysis. Network variables were entered into the hospital data set as context data. Since the combined sample was not powerful enough for a proper multi-level analysis, different methods (including t-tests, Mann-Whitney rank-sum tests, chi2 tests, Kendall's tau_b correlations, and regression analyses) were used in a triangulated approach to approximate a path analysis for network impact on member

organisations' implementation of health promotion structures and processes.

Results

Based on the literature, the purpose of networks in the settings approach was framed as supporting participating organisations in the implementation of health promotion structures and processes. The networks' ability to fulfill this purpose was labeled as their productive effectiveness, while the networks' ability to sustain themselves over time, as an indispensable precondition for their productive effectiveness, was called their reproductive effectiveness.

Following a quality approach, specific sub-sets of network structures and strategies were identified as being specifically relevant for both types of network effectiveness.

With regard to the networks' reproductive effectiveness, an advanced level of formalised institutionalisation in four dimensions (network aims; structures and resources of coordination; admission rules and procedures; technologies of communication and networking), measured as the networks' "ASAP" score, proved specifically important, while network age was found to be a risk factor for network viability. For the networks' productive effectiveness, the analysis had identified eight network interventions with an additive effect on the implementation of health promotion structures on hospital level. Networks were especially able to provide these interventions if they showed a good ASAP score, if health promotion in the network country/region was reinforced by supportive legal frameworks, if member organisations were involved in decision-making in the network, and if there was a good level of connectedness between the members (5).

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Researchers from the HPH Network initiate a global Scientific Society of Clinical Health Promotion

About the Scientific Society

The society is a non-profit entity organised exclusively for charity as well as educational and scientific purposes.

Annual membership fee is 50 €.

A reduced price applies to young researchers (<36yrs) 30 €

Read more about membership benefits and sign up at www.clinhp.org

Contact:
scisoc@clinhp.org

As a new initiative, an upcoming scientific society for researchers with an interest in the HPH Network and research within the area of of comprehensive clinical health promotion for patients, staff and community is in the pipeline and will be presented at the 21st international HPH Conference in Gothenburg, 23-24 May.

The scientific society offers researchers and anyone interested in research the opportunity to exchange knowledge and build on research-oriented collaborations. As Clinical Health Promotion is still a relatively new area of research, the society will function as a platform for all researchers and provide a dynamic, international forum for discussion and dissemination of relevant research results.

A special focus for the society will be young researchers and it will offer support and encouragement to this group through workshops, tutorials, and meet'n'greets with professors and senior researchers.

The Scientific Society was presented to the HPH governance Board 3rd of May, who welcomed the initiative.

The society will be given a name through an open competition, and we would like to invite all those interested to send their proposal for a name to scisoc@clinhp.org

Hanne Tønnesen & Jürgen Pelikan

News from the International HPH Network

The Swedish HPH Network: From a single Pilot Hospital to a Network of networks

This year, the 21st International HPH Conference takes place in Gothenburg, Sweden. For that occasion, we would like to introduce the Swedish HPH Network and their important work on strengthening the focus on health promotion in Sweden.

About the NETWORK

The Swedish HPH Network has existed since 1995 and has today a total of 84 members nationwide.

The network have had financial support from the Swedish Ministry of Health & Social Affairs for several years.

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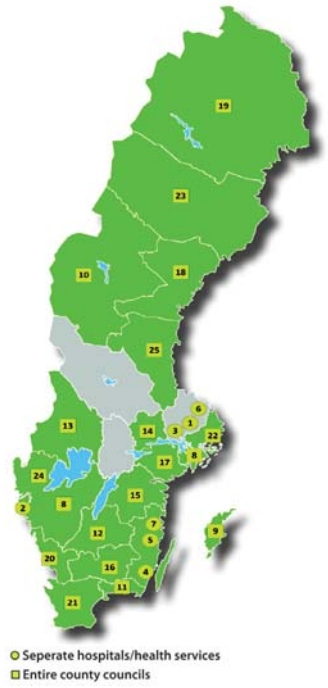
Swedish HPH Network members 2013



The Swedish HPH Network

The Swedish HPH Network was established in 1995, when the European Pilot Hospital Project of Health Promoting Hospitals (EPHP) ended its two-year process. Sweden took part in this project through the University Hospital in Linköping, being one out of 20 pilot HPH hospitals. The secretariat has, from the beginning of the network, been in Linköping at the Public Health Centre in Östergötland.

The number of members has increased steadily over time, at first slowly, and then more rapidly during the later years. Today the network includes almost all of Sweden, as 18 of 21 county councils/regions are members. As for one of the three "absent" counties, all hospitals and the full primary care are members of the network and in total, the Swedish HPH Network compromises 84 hospitals and primary care organisations.

The Swedish Model

The Swedish HPH Network builds on regions/county councils, and only a few hospitals/primary cares are registered as "individual" members. As regard of the International HPH Network, all Swedish members are registered as members of the Swedish Network and all are paying the international member fee.

The choice of using regions as members was made by the members themselves, based on the experience that governance is so central for a hospital/primary care to have the possibility to develop; i.e. as single members, managers sometimes felt that they were not" allowed" to work in a health orientation. Having regions as members means that the decision to become member lies at the highest political level, and that membership is a means for politicians to get help with the development of health services.

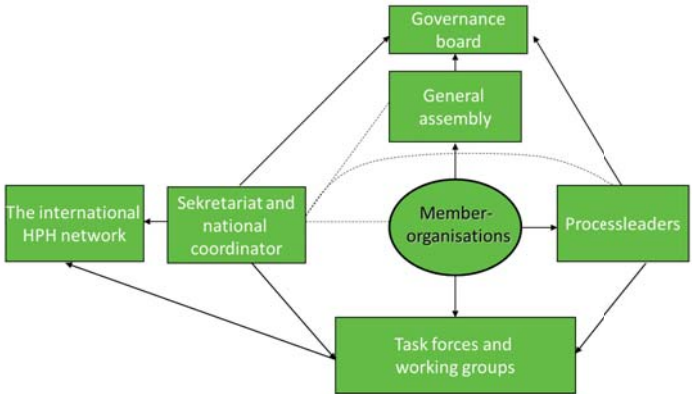
The county approach also enhances a strong collaboration across sectors, i.e. between hospitals within the county and between hospitals and primary care. This has been evident in new applications from counties where there used to be only single hospital members. The new applications encompasses "cross county projects"; such as the development of a smoke free politic for all hospitals and clinics. Also, being member as a county means that the member comprises those who define the agreements and purchasing system, which gives possibilities to collaborate in the development of these agreements.

When regions and not hospitals/primary care organisations are networking, you could of course be running the risk that the development moves away from the hospitals and clinics and becomes only bureaucratic. To avoid this, the Swedish Network supports that each member has several process leaders and that local networks have been built up within each region. Thus the Swedish HPH Network is a network of networks. National meetings are organised for the different groups: At the General Assembly, the directors of the counties or hospitals/

primary care organisations meets biannually. At the GA large members have more votes.

In parallel, the process leaders meet more often, and at these meetings each member can send several process leaders. Moreover, all members are encouraged to participate in the different task forces.

Organisational structure of the Swedish HPH network



Task forces

HPH is a comprehensive concept based on a holistic view on health and on the objective of health services. The Swedish HPH Network has been built on this holistic approach and therefore by May 2013 have 12 task forces: Health promoting encounters, Tobacco prevention, Alcohol prevention, Health promoting nutrition, Physical activity, Health promoting care environment, Mental health, Health promoting work environment, Accident prevention, Patient Reported Outcome Measurements, Health promoting primary care, Management and purchasing systems, and Indicators for HPH.

The task forces are the core of the HPH network and are based on active members driving the development in their respective area; hereby focusing on creating learning opportunities. Thus, seminars and workshops are central ways of working, along with the website, where each task force has their own page, which is an important tool to disseminate information and material.

Influence on national decision and support from national decisions

The Swedish HPH Network has close contacts within several national agencies. One very important development was in 2003, when the Swedish Government decided on national targets for public health. One sub-target (no 6) is: "A more health promoting health service." The background text alludes to the International HPH Network initiated by WHO and the content of this target is very similar to the aims of the Swedish Network.

The network has participated in the development of the national guidelines in Sweden for lifestyle intervention. The Swedish HPH national coordinator has acted as a medical adviser and is also responsible for the development of employed indicators in this work. The Swedish HPH Network is now an important part of the implementation of these guidelines, in collaboration with all national agencies, incl. the professional organisations for instance for physicians and nurses. The Swedish HPH Network has benefitted strongly from a large financial support from the Swedish Ministry of Health and Social Affairs over the cause of five years. Besides the financial part, the official acceptance and appreciation of the work done by the Swedish HPH Network is of great value.

Challenges met and overcome in the network

One major challenge is to integrate health orientation into the ordinary management of hospitals/primary care. A solution on how to overcome the challenges is arguing that the HPH concept is an important way of using the ressources in health services most effectively.

The Swedish HPH Network has worked together with health economists to develop a "health calculator", which can estimate the future costs - both financially and in regards to ill-health - if nothing is done about lifestyles. The involvement of managers in seminars, the link to ordinary quality assurance, and evidence-based medicine is of importance, as are the discussions with purchasers.

The future of the Swedish Network

The network believes that a linking to ordinary systems is fundamental to the long-term survival of the network; and ideally, the concept is a natural part of the vision and mission of health services. There is still some way to reach to this point. One step is a discussion on how to link the network more firmly to the SALAR (Swedish Association of Local Authorities and Regions), as this is the organisational body with the mandate for the coordination of these regions. In this work, a focus on Equality in health and in health care are prioritised. The Swedish HPH Network emphasises their delight of the national and cross-sectorial acceptance of the fact that a focus on health promotion and disease prevention can help reduce inequality in health and in health care.

News from the International HPH Network

IHF and HPH have signed Memorandum of Understanding

About the IHF

IHF is the global association of health care organizations and it develops and maintains a spirit of cooperation and communication among hospitals and health care organisations, with the primary goal of improving the health of society.

IHF website: www.ihf-fih.org

To read more about the IHF Conference please visit: www.oslo2013.no

Contact:
IHF secretariat
info@ihf-fih.org

For more information about the pre-conference "Innovative Value-adding Hospital Management in an NCD Era: Act NOW" please contact:

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The proposed and agreed Memorandum of Understanding between the International Hospital Federation (IHF) and the International HPH Network (HPH) is now signed. The collaboration was initiated by CEO of IHF, Eric de Roodenbeke and Chair of HPH, Dr. Shu-Ti Chiou.

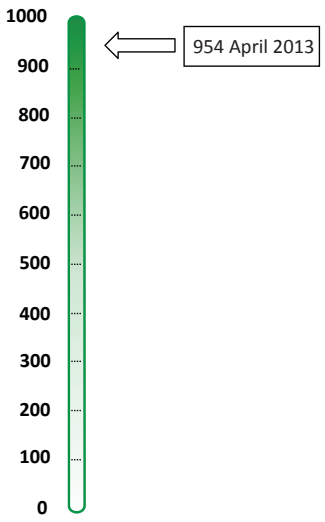
At two online meetings in the spring of 2013, Eric de Roodenbeke and CEO of the International HPH Secretariat, Hanne Tønnesen discussed the future collaboration and new mutual projects. The meetings highlighted a list of overlapping focal points, and the possibility of a mutual research project on identifying health promoting activities in European countries was outlined.

The collaboration between HPH and IHF will primarily focus on communication and capacity building.

Part of the action plan for communication is a co-written article about the importance of having a policy for health promotion with information on the outcome of implementing HP in practice and the financial benefits of such activities.

As part of the action plan for Capacity Building, it was decided that IHF and HPH will participate in each other's main conferences in 2013. At the 21st international HPH Conference in Gothenburg, Eric de Roodenbeke is invited as keynote speaker to give a presentation of IHF with a special focus on how IHF and HPH can join force in enhancing the importance of implementation of health promotion in hospitals and health services. HPH will participate in the IHF conference in Oslo, June 18-20, and host a pre-conference titled "Innovative Value-adding Hospital Management in an NCD Era: Act NOW" at the conference venue on June 17.

In the long run, both HPH and IHF see many beneficial outcomes of the established partnership and anticipate a fruitful collaboration.



Member update: The International HPH Network now totals 954 members

If your hospital or health service is interested in joining the International HPH Network, go to HPHnet.org and find more information about what HPH can do for your organisation and why Health Promotion in Hospitals and Health Services is vital for the improvement of health for patients, staff and community.

In the 'Members' section at HPHnet.org you will find all information required for membership.

For further questions about the HPH Network, feel free to contact the secretariat: info@hphnet.org.

News from SEEHN

South-eastern Europe Health Network: Partnership for health and sustainable growth in South-eastern Europe

The relationship between Clinical Health Promotion and The South-eastern European Health Network now manifests in an official collaboration. This is the first in an ongoing series of articles intersecting the specific interests of Clinical Health Promotion and The South-eastern European Health Network

About SEEHN

The article initiates the a collaboration between Clinical Health Promotion and The South-eastern European Health Network.

The collaboration means that in each issue of Clinical Health Promotion, SEEHN presents news articles on topics relevant for the readers of the Journal and the members of SEEHN:

For more information about SEEHN, visit the website: www.moh.gov.mk

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The South-eastern European Health Network (SEEHN) is a governmental sub-regional cooperation established in 2001. SEEHN consists of ten countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Israel, Macedonia, Moldova, Montenegro, Romania, and Serbia. SEEHN uses health as a tool to contribute to the stability and non-conflict of South-eastern Europe and to work towards peace and reconciliation, as well as economic development and European integration of its member states. Due to the variety in member states in terms of economic and social development, SEEHN has defined itself as a forum for exchange, a capacity building initiative, a learning process, and a health diplomacy tool. This definition encompasses the need for developing sub-regional and national institutions, policies, and programs in strengthening health systems and public health based on evidence. WHO, Regional Office for Europe is one of SEEHN's founders and has supported the SEEHN from its establishment.

Over the course of twelve years, the results of the SEEHN cooperation process has yielded important lessons. These are about ways of building capacity, the effectiveness of capacity building efforts, and approaches for institutionalising the capacity to cooperate at sub-regional

SEEHN Member States and Partners at the SEEHN III Ministerial Forum in Banja Luka, 2011.

News from SEEHN

level in strengthening health systems and public health aimed at:

- bottom-up effect of influencing European policies through active participation in the process of their development,
- top-down effect of influencing national policies by taking resolute action in implementing those European policies , and
- horizontal effect of sharing knowledge and exchange information among the SEEHN member states and thus providing opportunities for bridging gaps in health and development.

Throughout more than a decade of operation, the SEEHN has gradually increased both it's technical and geographic area of work and has changed the process of sub-regional cooperation. This way SEEHN allows for greater quantities, better quality and sustainability of its work and results. This constant adaptation demands a constant upscaling of learning and capacity building across the SEEHN. Most recently, the SEEHN member states have pledged implementation of H2020 and the European Action Plan at the WHO RC 62 in Malta. The implementation follows the SEEHN strategic goals 2011-2014, stated in the Banja Luka Pledge, to reduce inequalities in health. In addition, the SEEHN today influences development of the regional policy SEE2020 in the area of health. Developing further national and sub-regional capacity for health policy and systems development and research thus remains critical, so that the SEEHN can continue to play a multifaceted role in health developments and overall sustainable growth in the South-eastern Europe.

The ten SEEHN member states have signed the first legally binding Host Agreement on the arrangements of the Seat of the Secretariat with the Host Country (MKD) in 2010. The Seat of the SEEHN Secretariat has been established and has operated as an international organisation since March, 2013, taking a central role in integrating political and technical work of the SEEHN and support to the SEEHN activities and their visibility. The Seat of the Secretariat also functions also as a documentation centre of the SEEHN work and a facilitator to the ever increasing communication of and with the SEEHN.

Today, SEEHN is an acknowledged partner of the major actors on the European health scene, as are the WHO, Regional Office for Europe, Council of Europe, Council of Europe Development Bank, Regional Cooperation Council, International Organisation for Migration, European Health Forum Gastein, The International Network of Health Promoting Hospitals and Health Services (HPH), Nordic Dimension Partnership in Public Health and Social Well-being, EUROHEALTHNET and many others.

The International HPH Network committing to the partnership with the SEEHN: Dr. Hanne Tønnesen, CEO at the HPH Secretariat signs the SEEHN Banja Luka Pledge at the III SEEHN Ministerial Forum in Banja Luka, 2011.

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