Effects of network development on attitudes towards work and well-being at work among health care staff in northern Finland

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ABSTRACT

Objectives. To assess the effects of network development between primary and special health care units on attitudes towards work and well-being at work among health care staff.

Study design. A prospective quasi-experimental design with intervention (n=33) and control (n=23) groups. This 2-year pilot intervention study was implemented in 14 health centres and 4 hospitals in northern Finland.

Methods. The material was gathered via self-reported questionnaires from the health care staff at baseline and 1 follow-up. The intervention was composed of regional networking, self-ruling teamwork, staff education and guidance for the multiprofessional teams consisting of participants from primary and special health care units. The objective of these teams was to construct and disseminate regional models of patient education for the service process of 6 patient groups: cardiovascular, COPD, total joint replacement, cerebral infarction, cancer and chronic ulcer patients.

Results. The network development intervention had positive effects on attitudes towards work concerning organizational commitment, occupational commitment and growth satisfaction. The positive effects were also found in well-being at work, measured by absorption. The results are encouraging, although the study failed to demonstrate statistically significant improvements in other attitude and well-being outcomes that were measured.

Conclusions. Network development intervention particularly improved positive attitudes towards work among health care staff. Although randomized controlled trials are needed, regional network development between health centres and hospitals is recommended when the goal is positive attitudes towards work and well-being at work in sparsely populated and rural areas.

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Keywords: attitudes towards work, health centre, hospital, intervention study, networking, well-being at work
INTRODUCTION

Innovative ways to develop and organize work are needed in health care organizations today, particularly in sparsely populated and rural areas. These areas face several challenges, such as long distances, health care staff shortages, ageing and diminishing populations, declining municipal economies and growing special health care costs. Changes in the health care system, for example, the shortening of shifts for nurses, an increasing number of outpatients, the development of patient-oriented service processes, management and evaluation of care pathways as well as recruitment and well-being of staff have also posed demands to regional networking and co-operation between primary and special health care services.

Different staff development interventions have been shown to have positive effects for workers, such as reduced stress and exhaustion and a strong rise in job satisfaction (1). An intervention consisting of education, support and clinical supervision has been found to have positive effects on work satisfaction (2). Furthermore, work reorganization that involves staff participation has been shown to limit the effect on work-related stress (3). However, even though participatory organizational intervention limits job stress, a corresponding effect was not found in subjective health (4). Büssing and Glaser (5) found that work stressors were substantially reduced for nurses in the course of redesigning roles and duties, while emotional exhaustion and depersonalization increased. Participatory organizational intervention carried out by a work team has been shown to decrease effort-reward imbalance and absenteeism rates (6).

Intervention to enhance nursing staff teamwork and engagement has resulted in lower staff turnover (7). Team-building has also been shown to improve job satisfaction for nursing staff (8). In sum, the previous results from staff development interventions have been positive in some areas and somewhat inconsistent in others.

Keeping this in mind, it should be noted that the majority of health promotion and occupational stress intervention studies have focused on interventions at the individual level, neglecting organizational factors (9). This pilot intervention study represents an intervention study at the organizational level, where attitudes towards work and well-being at work were measured from the positive and resource-centred perspective, which is a different approach compared to those taken in many previous studies.

The aim of this study was to assess the effects of network development between primary and special health care units on attitudes towards work and well-being at work among health care staff. It was hypothesized that the network development intervention would have positive effects on attitudes measured as organizational commitment, occupational commitment, job involvement, growth satisfaction and work motivation and on well-being outcomes: vigour, dedication, absorption, personal accomplishment, affective well-being and mental resources. These outcomes are widely used and measured in the field of work-life research when studying attitudes and well-being.

Herein, intervention research refers to a method used for investigating the effectiveness of network development in natural settings. Network development is defined as various
ways to promote factors such as knowledge, skills and social support, as well as establishing greater functionality in work units and work processes that cross organizational boundaries. Employees from different organizations work in multiprofessional teams where self-determining, participative, supportive and co-operative strategies are applied. The central tenet of network development is collaborative learning that involves groups of people working together to solve problems and create new innovations to help their organizations run more smoothly and to increase the productivity and well-being of workers.

MATERIAL AND METHODS

Study design
The study was carried out as a prospective non-randomized quasi-experimental design with intervention and control groups. This 2-year pilot intervention study was implemented in northern Finland. The material was gathered via self-reported questionnaires from the health care staff before the intervention (2006) and at 1 follow-up after the intervention (2008).

Settings and sample
The study was undertaken as a part of a larger staff development project implemented in northern Finland. It was carried out co-operatively by the regional health network, involving 14 health centres in sparsely populated and rural areas, as well as 4 hospitals. All the health centres and hospitals were self-selected to the project after meetings between representatives from the municipalities and hospitals. Criteria for inclusion required that the organizations must commit themselves to the entire 2-year study period and that the team members could participate in the intervention during their working hours. All the hospitals and nearly half of the health centres participated.

The regional networking was implemented in 6 multiprofessional teams. Teams were formed according to 6 patient care groups: cardiovascular (17 members), chronic obstructive pulmonary disease (COPD) (5), total joint replacement (12), cerebral infarction (14), cancer (11) and chronic ulcer (12). The patient groups were selected based on the needs of the participating organizations: these groups use many services in both primary and special health care. Each team had members from both primary and special health care units. Staff members working closely with these patient groups and who were willing to participate in network development were included in the intervention (1–5 participants from 1 health centre or hospital clinic).

The study consisted of 2 prospective samples. The active team members constituted an intervention group. Members of the control group were selected from units that were not taking part in the project. Control group members operated according to the usual practices in their units. Sample size calculations were based on the assumption that all the team members had the possibility to participate to the study; the pre-test surveys were sent to all team members (n=81). In the control group the sample size was 93 at baseline.

For the first round of data collection, 70 (86%) responded in the intervention group and 65 (70%) in the control group. The measurements were repeated for participants who responded to the pre-test survey. Twelve participants in the intervention group and 7 in the control group dropped out. For the second
round of data collection, 34 (59%) responded in the intervention group and 23 (40%) in the control group. One participant in the intervention group dropped out. The final sample size in the intervention group was 33 and 23 in the control group. These represent 41% and 25% of the pre-test sample sizes, respectively. Figure 1 is a flowchart of the study recruitment process, following the guidelines of the CONSORT 2010 Statement (10).

**Procedure**

The 2-year intervention was developed for health care staff working in teams. The objective of these teams was to construct regional models of patient education to explain the service process for the 6 patient groups and to disseminate these models to the work units taking part in the project. This was an important part of the study, because the participatory work improvement methods had to be successfully integrated into work routines while the formal structure of daily work had to be maintained after the project ended and, it was hoped, have a long-term positive effect (11).

The intervention included 5 main elements: regional networking, self-ruling teamwork,
collaborative learning, staff education and guidance. In regional networking, employees from different organizations worked closely together in multiprofessional teams. Within these teams self-determining, participative and co-operative strategies were applied and members used their own expertise in developmental work for the good of the whole team. In collaborative learning, new knowledge is created within a group where members interact by sharing relevant work experiences. Collaborative learning also refers to methodologies people use to engage in a common task where each individual depends on and is accountable to one another. Team members gathered together 12 times on average (SD 3.2, range 6–17) during the 2-year study period. Team members took part in educational sessions on average 2.5 times (SD 1.2, range 1–6). This education was provided to give staff the tools to develop quality patient education. Guidance was offered to each team 2 times, which included information about the participatory methods of modelling patient education across organizational boundaries.

Participating organizations signed a written agreement stating that they were committed to the project. Participation was voluntary and based on the interests of the target organizations to be included in the network which was developing the patient education program. The members of intervention group were told verbally in the information meeting about the purpose of the project, that the material would be confidential, and that they could, at any time, refuse to participate without any explanation or fear of consequences to themselves. The cover letter sent with the baseline questionnaire also included the same information.

**Instruments**

Attitudes towards work were measured as organizational commitment, occupational commitment, job involvement, growth satisfaction and internal work motivation; and well-being at work was measured as vigour, dedication, absorption, personal accomplishment, affective well-being and mental resources.

Organizational commitment was measured using 4 items (e.g., “I feel proud to be a part of this organization.”) from the Organizational Commitment Questionnaire (OCQ) (12) and 4 items from the Organizational Commitment Scale (OCS) developed by Cook and Wall (13). Occupational commitment was measured with 3 items (e.g., “I feel that the current occupation is ideal for me.”) based on Blau’s (14) study. Job involvement was measured using 3 items (e.g., “I feel that my personal life goals are job oriented.”) from the Kanungo’s Job Involvement Questionnaire (JIQ) (15). Growth satisfaction (2 items, e.g., “I have opportunities for personal growth.”) and internal work motivation (2 items, e.g., “I am satisfied when doing a good job.”) were measured with items from the Job Diagnostic Survey (JDS) (16). For all these scales, a 7-point response format (0=strongly disagree, 6=strongly agree) was used.

Vigour (6 items, e.g., “At my work, I feel bursting with energy”), dedication (5 items, e.g., “I am proud of the work that I do”) and absorption (6 items, e.g., “I am immersed in my work”) were measured with a 5-point scale ranging from 0 to 4 (never/often/always/continuously) from the Utrecht Work Engagement Scale (UWES) (17). Absorption means that employee is fully concentrated and happily engrossed in work. Personal accomplishment was measured with the 8 items (e.g., “I feel that I’m positively influencing other people’s lives
through my work.”) from the Maslach Burnout Inventory – Human Services Survey (MBI-HSS) with a 7-point response scale (1=never, 7=every day) (18). Affective well-being was examined with 3 contentment items and 3 enthusiasm items (e.g., “I feel optimistic”) on a 4-point scale ranging from 0 to 4 (not at all–very much) from the Warr’s Affective Well-being Questionnaire (WAWQ) (19). Mental resources were measured with the 3 items (e.g., “I enjoy daily tasks”) on a 5-point scale ranging from 0 to 4 (never/often/always/continuously) from the Work Ability Index (WAI) (20).

These widely accepted and well-validated instruments were used, and most of them have been shown to be reliable in Finnish working life. The internal consistency of the scales was assessed with Cronbach’s alpha reliability coefficient. There exists no agreement about the acceptable value of the coefficient alpha, but values below 0.60 are generally not considered adequate. The internal consistencies of all the scales were satisfactory for this study, since Cronbach’s alpha met the criterion of 0.60 (Table II).

Statistical analyses
Descriptive statistics were used to characterize the participants. The differences in the characteristics and outcomes at baseline between intervention and control groups were tested with the independent samples t-test, the Mann-Whitney test, the chi-square test or Fisher’s exact test, depending on the distribution of the data or the level of variables.

In the assessment of changes in attitude and well-being outcomes, a non-parametric Wilcoxon signed-rank test was used because the Kolmogorov-Smirnov test and histograms showed that the data were not normally distributed. Besides the statistical significance of differences between groups, the effect sizes (which are independent of sample size), were considered when estimating the practical significance of possible effects. Effect sizes were calculated by dividing the difference between pre-test and post-test median values using the inter-quartile range at pre-test (21). According to Cohen (22), the effect size of 0.20 is small, 0.50 is medium and 0.80 is large. The statistical analyses were made with the SPSS 17.0 software package, and the level of statistical significance was fixed at 0.05.

RESULTS
The participants’ characteristics and intervention and control group comparisons are presented in Table I. At baseline, the participants’ ages and work experiences had a similar distribution in the intervention and control groups. However, there were 2 statistically significant differences: participants in the control group worked more often in the hospitals and all of them worked in inpatient wards. There were no statistically significant differences in any attitude or well-being outcome at baseline between intervention and control groups.

For the intervention group, the Wilcoxon signed-rank test showed statistically significant improvements in attitudes towards work concerning organizational commitment, along with occupational commitment and growth satisfaction, but there were no statistically significant changes in job involvement and internal work motivation. The effect size was medium (about 0.50) in both growth satisfaction and occupational commitment, but in
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**Table I.** Characteristics of participants in the intervention and control groups.

| Characteristics | Intervention group (n=33) | Control group (n=23) | p |
|-----------------|--------------------------|---------------------|---|
|                 | mean                      | SD                  | mean | SD | range | p     |
| Age             | 43.7                      | 8.8                 | 43.3 | 9.4 | 28–59 | 0.869 |
| Work experience | 19.9                      | 9.2                 | 18.6 | 9.2 | 4.6–32 | 0.600 |
| Gender          | n                         | n                   | n    | n   |        | 0.411 |
| female          | 33                        | 22                  |      |     |        |       |
| male            | –                         | 1                   |      |     |        |       |
| Work task       |                           |                     |      |     |        | 0.734 |
| nurse           | 26                        | 19                  |      |     |        |       |
| other           | 5                         | 4                   |      |     |        |       |
| nurse manager   | 2                         | –                   |      |     |        |       |
| Organization    |                           |                     |      |     |        | 0.045 |
| health center   | 19                        | 26                  |      |     |        |       |
| hospital        | 14                        | 30                  |      |     |        |       |
| Work unit       |                           |                     |      |     |        | <0.001 |
| inpatient ward  | 17                        | 23                  |      |     |        |       |
| outpatient clinic | 16                    | –                   |      |     |        |       |

a = community health nurse, physiotherapist, practical nurse, b = internal medicine, surgery, oncology, pulmonary diseases and rehabilitation, c = Independent samples t-test, d = Fisher’s exact test, e = chi-square test.

**Table II.** Comparison of outcomes in the intervention and control groups.

| Outcomes                   | Intervention group (n=33) | Control group (n=23) | Cronbach’s alphas (n=56) |
|---------------------------|---------------------------|----------------------|--------------------------|
|                           | Median p-value ^ (effect size) | Median p-value (effect size) |                            |
| Organizational commitment |                           |                      |                          |
| Pre-test                  | 4.00 (0.044)              | 3.63 (0.922)         | 0.85                     |
| Post-test                 | 4.25 (-0.14)              | 3.50 (0.10)          | 0.89                     |
| Occupational commitment   |                           |                      |                          |
| Pre-test                  | 4.00 (0.011)              | 4.00 (0.780)         | 0.87                     |
| Post-test                 | 5.00 (-0.43)              | 4.33 (-0.20)         | 0.81                     |
| Job involvement           |                           |                      |                          |
| Pre-test                  | 1.33 (0.344)              | 1.33 (0.095)         | 0.60                     |
| Post-test                 | 1.00 (0.33)               | 1.33 (0.00)          | 0.66                     |
| Growth satisfaction       |                           |                      |                          |
| Pre-test                  | 4.00 (0.017)              | 4.00 (0.600)         | 0.83                     |
| Post-test                 | 5.00 (-0.57)              | 4.50 (-0.25)         | 0.86                     |
| Internal work motivation  |                           |                      |                          |
| Pre-test                  | 4.50 (0.282)              | 5.00 (0.070)         | 0.61                     |
| Post-test                 | 5.00 (-0.25)              | 4.50 (0.50)          | 0.65                     |
| Vigor                     |                           |                      |                          |
| Pre-test                  | 4.67 (0.128)              | 4.50 (0.657)         | 0.80                     |
| Post-test                 | 5.00 (-0.33)              | 4.33 (0.13)          | 0.87                     |
| Dedication                |                           |                      |                          |
| Pre-test                  | 5.20 (0.057)              | 5.20 (0.896)         | 0.86                     |
| Post-test                 | 5.40 (-0.14)              | 4.80 (0.33)          | 0.90                     |
| Absorption                |                           |                      |                          |
| Pre-test                  | 4.17 (0.014)              | 4.50 (0.896)         | 0.83                     |
| Post-test                 | 4.67 (-0.33)              | 4.17 (0.18)          | 0.90                     |
| Personal accomplishment   |                           |                      |                          |
| Pre-test                  | 4.75 (0.064)              | 4.88 (0.972)         | 0.82                     |
| Post-test                 | 5.00 (-0.27)              | 4.63 (0.20)          | 0.90                     |
| Affective well-being      |                           |                      |                          |
| Pre-test                  | 2.50 (0.173)              | 2.50 (0.476)         | 0.90                     |
| Post-test                 | 2.83 (-0.33)              | 2.83 (-0.25)         | 0.88                     |
| Mental resources          |                           |                      |                          |
| Pre-test                  | 3.00 (0.449)              | 3.00 (0.134)         | 0.87                     |
| Post-test                 | 3.00 (0.00)               | 3.00 (0.00)          | 0.86                     |

^ Wilcoxon signed-rank test.
organizational commitment it was small (lower than 0.20). The results showed no statistically significant changes to these attitude outcomes in the control group (Table II).

There were also some positive effects of the network development intervention on well-being at work. Absorption increased in the intervention group during the study period. There were also improvements in dedication and personal accomplishment, but these changes were suggestively statistically significant. However, there were no statistically significant effect of the intervention on vigor, affective well-being and mental resources. The results showed no statistically significant changes in any well-being outcome in the control group. On the other hand, the control group had a downward trend in internal work motivation. In the intervention group internal work motivation increased, but job involvement decreased, although these changes were not statistically significant (Table II). Thus, the network development intervention has positive effects on some, but not all, attitude and well-being outcomes measured.

DISCUSSION

The network development intervention had positive effects on attitudes towards work described by organizational commitment, occupational commitment and growth satisfaction. The positive effect was also found in well-being at work, measured by absorption. However, the differences between pre-test and post-test values concerning organizational commitment and absorption lack practical significance although the numbers were statistically significant. These differences were illustrated by the fact that, in these cases, the effect sizes were small.

Nevertheless, the results were mainly in line with the previous studies, which have shown that different staff and work development interventions reduce exhaustion (1) and stress (1,3,4) and increase job satisfaction (1,2,8). The network development intervention was based on participation and self-direction of health care staff in teams. The participation process in itself has shown a positive impact on well-being (4).

The results are encouraging, although this pilot intervention study showed no effect on job involvement, internal work motivation, vigour, dedication, personal accomplishment, affective well-being and mental resources. Also, Mikkelsen et al. (4) found no effect of participatory organizational intervention on subjective health. On the other hand, Büssing and Glaser (8) found that in the course of redesigning work roles and duties, emotional exhaustion and depersonalization increased. It may be difficult to affect something like job involvement or internal work motivation with one specific intervention because there are many individual and organizational factors influencing the work situation. In addition, work attitudes and well-being are multidimensional concepts that can be measured with different instruments, as they were in this study. When the results are interpreted, it should be taken into account that these outcomes are also related to each other.

The intervention lasted 2 years, so it was possible to get preliminary evidence about possible long-term effects, although in previous studies the effects of interventions on psychological well-being have been shown to be beneficial in the short term. Nonetheless, inter-
ventions promoting innovation at work have shown promise in addressing occupational strain and promoting psychological well-being in the long term as well (23). In the multiprofessional teams, new innovations were produced – a regional model of patient education for 6 patient groups that crossed all organizational boundaries.

However, the present study is not without limitations. The final sample sizes were quite small, and in the control group the dropout rate was particularly high. Although intent-to-treat is usually the goal, in this case the dropout rates were relatively high, and for this reason interpretable intent-to-treat analysis may not be achievable. With regard to studying the effects of staff development intervention, the ideal design would have been a randomized, controlled trial. But as Griffiths (24) has noted, this kind of study design is extremely difficult to apply to work and health studies. This research was designed as a quasi-experimental study, in which intervention was conducted at some work units on a voluntary basis, while work units without intervention formed the control group. As a result, it was not possible to randomize the participants in the intervention and control groups. Even so, since the intervention and control groups were quite similar at baseline, selection bias is unlikely to have influenced the findings.

In conclusion, the network development intervention particularly improved positive attitudes towards work among health care staff. Network development between health centres and hospitals can be recommended when the goal is for employees to develop more positive attitudes towards work and well-being at work in sparsely populated and rural areas. Network development strengthens primary health care by promoting the knowledge and skills of health care staff and the functionality of the work units. Regional networking also improves the partnership between primary and special health care, which is dictated by the national guidelines in Finland. The results can be directly used in practice in managerial roles and also when designing intervention studies to increase staff development. Nevertheless, further studies with randomized controlled trials and larger samples, as well as the triangulation of quantitative and qualitative data are needed to examine the effects of different staff development interventions for staff member and patient outcomes and the effectiveness of health service delivery.

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Conflict of interest statement
The authors have no conflicts of interest concerning this study.

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